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

(Common to all Branches)

(With effect from 2018 – 19 Academic Year)

Bachelor Degree in Engineering

Out Come Based Education

with

Choice Based Credit System

P.E.S. College of Engineering, Mandya - 5 71 401, Karnataka

[An Autonomous Institution affiliated to VTU, Belagavi ,

Grant – in – Aid Instituti on (Government of Karnataka), World Bank Funde d College (TEQIP), Accredited by NBA, New Delhi and Approved by AICTE, New Delhi]

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

Fax: 08232 – 222075

E– Mail: principal@ pesce.ac.in; Website: www.pescemandya.org / www. pesce.ac.in

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

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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 qua lity 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

***P**rofessionalism*
***E**mpathy*
***S**ynergy*
***C**ommitment*
***E**thics*

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 position 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 center, 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

Dr.Umesh D R

Preface

This document gives a brief insight about Profile of our College, Academic Reg ulations of the Autonomous System of the college, Scheme of teaching and exa mination with effect from 2018-2019 Aca demic year and 1st year Syllabus which is C ommon to all branches of Engineering.

Dr.P S Puttaswamy

PES College of Engineering, Mandya, started in the year 1962, has b ecome autonomous institute in the academic ye ar 2008-09. Since, then it has been doing the academics and assessment activities successfully. The college is running 8 undergraduate and 8 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 mem ber nations. The implementation of Outcom e Based Education (OBE) has been the core issu e for enabling the equivalence and of Indian degrees and their mobility across the various countries.

*Our Higher Educational Ins titution has adopted the Choice Based Credit System (CBCS) based semester structure with OBE scheme and grading system w*hich provides the flexibility in designing curriculum and assigning credits based on the course co ntent and hours of teaching. There lies a shift in thinking, teaching and learning proces s moving towards Students Centric from Teach ers 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 f or learning which enables integration of concepts, theories, techniques. These are greatly enhances the skill/employability of students.

In order to increase th e Industry / Corporate readiness, many Soft Skills, Self-learning components and Personality Development modules have been added to the existing curriculum. In order to enh ance creativity and innovation Internship and Self-learning Courses are made mandatory for all undergraduate programs.

Dr. Umesh D R
Deputy Dean - Academic
Associate Professor,
Dept. of Computer Science & Engg.

Dr.P S Puttaswamy
Dean - Academic
Professor,
Dept. of Electric al & Electronics Engg.

Contents

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 Visvesvaraya 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 and also beneficiary of TEQIP grants. The college is now managed by Peoples Education Trust ®, Mandya and is led by ***Sahakari Rathna 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 Visvesvaraya Technological University. The total intake of the college is 670 students for UG course and 146 students for PG course, besides more than hundred research scholars pursuing their M.Sc. (Engg.) & Ph.D. programs.

After obtaining the Autonomous status the Management has redefined its vision and mission ***"It is committed to develop student potential throu gh 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 equipment's 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 Engineering 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.

Our college has got distinction of having research center 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 53 PESCE faculty members (Ph.D. guides) who are guiding more than 125 research students for Ph.D. 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 updated as per AICTE Model curriculum 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. Krishna Venkatesh, Director, Centre for Incubation, Innovation, Research & Consultancy, Jyothi Institute of Technology, Thataguni, Bangalore, Dr. H.V. Venkatakrishna, retired Professor, NITK, Surathkal and Dr. Ramaswamy, retired Professor, Anna University, Chennai. 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, Man dya	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. Krishna Venkatesh** Director, Centre for Incubation, Innovation, Research & Consultancy, Jyothi Institute of Technology, Thataguni, Bangalore	VTU Nominee
11	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 62 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: 1,12,000, E-Journals: 32,712, 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 equipment's 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 guidance of 205 distinguished faculty members. The qualities, dedication and experience of the faculty are the highlights of this institute, where, 50 faculties holding Ph.D. degree and the remaining 151 are postgraduate degree holders. The average experience of the faculty is around 17 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	60
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 & Engineering	2000	60
		Total Intake	670

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: 670 UG, 246 PG, 134 Research Scholars**

Faculty Strength		205	
Ph.D.		50	
M.Tech. /ME/ M.Sc.		151	
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	1:15	--
4.	Electronics & Communication Engineering.	1:15	1:18
5.	Automobile Engineering	1:15	--
6.	Industrial & Production Engineering	1:15	--
7.	Computer Science & Engineering	1:15	1:12
8.	Information Science	1:15	--
9.	Master of Computer Applications	--	1:16
10.	Master of Business Administrations	--	1:15

Library and information center

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 bar-coded and classified as per Dewey decimal classification also the book transaction is computerized.

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 2,200 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.
- 125 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
- Open auditorium having a 1000 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 modernize 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 programs.
- 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.

Dr. Umesh D R
Deputy Dean - Academic
Associate Professor,
Department of Computer Science & Engg.

Dr. P S Puttaswamy
Dean - Academic
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), Semester End Examinations (SEE), Make-up Examinations (MUP) and Supplementary Semester Examination (SSE) 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, MUP & SSE) 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, MUP & Supplementary Exams) 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 informs 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.

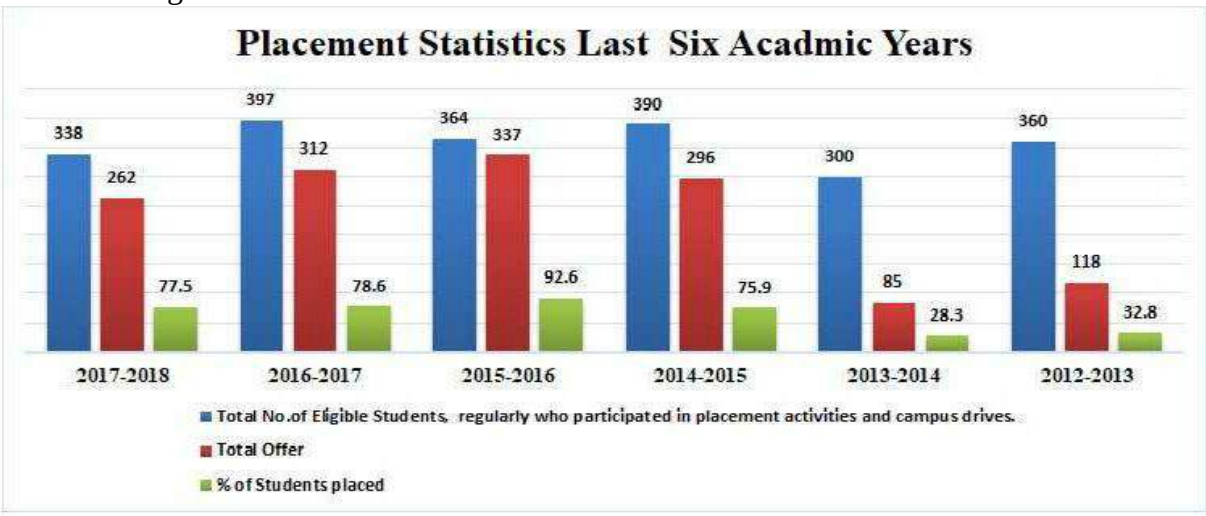
An intensive **"Vocational" placement** specific training programme is being conducted before and after **6**th semester. A " **Company-Specific"** training programme helps to equip the students for different recruitment processes; they face in the **7**th semester.

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 7thsemester 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 academias are enrolled with PET research foundation for Ph.D. programmes and the institute has produced 85 Ph.Ds. and 14 M.Sc. Engg. till date. 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	12
Mechanical/Automobile/IP	14
Electrical/Electronics	33
CS/IS	13
Mathematics	07
Chemistry	01

Research Programs

M.Sc. (Engineering) by Research and Ph.D. under VTU, 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

Centre 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 poly techniques 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 chip kit 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 BOSCHBengaluru
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

P.E.S. COLLEGE OF ENGINEERING
(AUTONOMOUS), MANDYA – 571 401

(Affiliated to Visvesvaraya Technological University, Belagavi)

ACADEMIC REGULATIONS

[B.E., M.Tech., M.C.A. & M.B.A.]

2018 - 19

ACADEMIC REGULATIONS

1. TITLE AND COMMENCEMENT:

1.1. These Regulations shall be called "P E S Coll ege of Engineering, Mandya, (PESCE) Regulations - 2018 under Visvesvaraya Technological University, Belagavi for Bachelor of Engineering (B.E.), Master of Technology (M.Tech.), Master of Computer Applications (MCA) and Master of Business Administration (MBA) Degree programmes. All the rules and regulations have been approved by the Academic Council Constituted by PESCE, Mandya.

1.2. These Regulations shall govern all the students seeking admission to the various programmes from the academic year 2018-19.

REGULATIONS (GENERAL)

G.1 INTRODUCTION

G.1.i The General Regulations that are common to all Undergraduate (UG) and Postgraduate (PG) Degree Programmes of PESCE, are presented here. Specific regulations relating to a particular Degree Programmeare given separately along with the corresponding curriculum.

G.1.ii These Regulations govern the policies and procedures on the admission of students, teaching, conducting of examinations, evaluation, announcement of results and Graduation ceremony.

G.1.iii These Regulations are approved by the Governing body of PESCE on recommendation of the Academic Council of PESCE and shall supersede all corresponding earlier Regulations of the PESCE College, along with the amendments thereto, and shall be binding on all concerned undergoing the said programmes.

G.1.iv These Regulations may evolve, get refined, revised, updated, amended, modified or changed through appropriate approvals from the Governing body on the recommendation of the Academic Council from time to time, and shall be binding on all parties concerned.

G.1.v Periodic refinements in the Academic Regulations and Curriculum on the students admitted in the earlier years, shall be dealt with appropriately and carefully, so as to ensure that such students are not subjected to any injustice whatsoever, although they are required to conform to these revised Regulations and Curriculum.

G.1.vi In order to guarantee fairness and justice to all the parties concerned, in view of the periodic revisions and refinements, specific issues referred to shall be addressed separately by the Academic Council of the College.

G.1.vii The Governing Body shall consider all issues relating to the Academic activities of PESCE for appropriate action, irrespective of whether a reference is made in these Regulations or otherwise.

G.1.viii The Principal may co-opt or invite experts from outside or within to any of the Academic Council meetings.

G.1.ix Any disputes arising from these Regulations must be addressed to the Governing Body of PESCE. The decision of the Governing Body shall be final and binding on all parties concerned.

G.1.x Any legal disputes arising from these Regulations shall be limited to the legal jurisdiction determined by the location of PESCE, which is the City of Mandya, Karnataka State and not that of any other party.

2. NOMENCLATURES USED:

(i) **"Academic Autonomy"** means freedom granted by the University to a College in all aspects of conducting its academic programmes for promoting excellence.

(ii) **"Autonomous College"** means a College notified as an *autonomous college* by the University as per the VTU Statutes on Autonomous Colleges (Amended) 2011 and further amended from time to time as per UGC Regulations/Guidelines.

(iii) **"Commission"** means University Grants Commission.

(iv) **"Council"** means All India Council for Technical Education.

(v) **"University"** means Visvesvaraya Technological University.

(vi) **"College"** means P. E. S. College of Engineering (PESCE), Mandya.

(vii) **"AC"** means Academic Council of PESCE.

(viii) **"BoS"** means Board of Studies of various disciplines of PESCE.

(ix) **"BoE"** means Board of Examiners of various disciplines of PESCE.

3. PROGRAMMES OFFERED IN THE COLLEGE

(i) UG Level: Bachelor of Engineering (B.E.)

(ii) PG Level: Master of Technology (M.Tech)

Master of Computer Applications (M.C.A.)

Master of Business Administration (M.B.A.)

3.1. UG AND PG DEGREE COURSES

(i) B.E. Degree Programmes

Automobile Engineering

Civil Engineering

Computer Science and Engineering

Electrical and Electronics Engineering

Electronics and Communication

Engineering Industrial & Production

Engineering Information Science and

Engineering Mechanical Engineering

Other Teaching departments are:

Physics,

Chemistry,

Mathematics&

Humanities, Social Science and Management.

(ii) M.Tech. Degree Programmes

Civil Engineering	-	CAD of Structures
Computer Science and Engineering	-	Computer Science and Engineering
	-	Computer Engineering
Electronics and Communication Engineering	-	VLSI & Embedded system
Mechanical Engineering	-	Computer Integrated Manufacturing
	-	Machine Design

(iii) Master of Computer Applications (MCA)

(iv) Master of Business Administration (MBA)

4. DURATION OF THE COURSE

4.1. Normal Duration:

The normal duration of an academic programme is

(i) Four years for B.E.

(ii) Two years for M.Tech. and M.B.A.

(iii) Three years for M.C.A.

4.2 Maximum Duration:

The maximum period that a student can take to complete an academic programme shall be double the normal duration of the programme. Further, the maximum period for students under lateral entry for B.E. course shall be six years and in case of lateral entry for M.C.A. course shall be four years.

The total number of credits required to be earned by a student to qualify for the award of Degree shall be as given in Table 1.

Table 1: Total Number of *Credits* to Qualify for Degree Award

Programme		Normal Duration: Years (Semesters)	Total number of *Credits* to be Earned
UG Degree	*B.E.*	4 (8)	175
	B.E. (Lateral)	3 (6)	135
PG Degree	*M. Tech.*	2 (4)	88
	M.B.A.	2 (4)	100
	M.C.A.	3 (6)	132
	M.C.A. *(Lateral)*	2 (4)	88

5. COURSE STRUCTURE

(a) B.E. Programme: The B.E. Programme shall consist of courses and each course shall be assigned with credits. The Minimum credit requirement for the B.E. and B.E. (Lateral) degree are 175 and 135 respectively. The total course of a B.E. degree programme will typical consists of

i.	**Humanities, Social Sciences and Management (HSMC)**	06 – 08 Credits
ii.	**Basic Sciences (BSC)**	25 – 30 Credits
iii.	**Engineering Sciences (ESC)**	20 – 25 Credits
iv.	**Professional Courses (PCC) – Core**	65 – 70 Credits
v.	**Professional Courses(PEC) –Elective**	12 – 15 Credits
vi.	**Other Open Elective Courses(OEC)**	06 – 09 Credits
vii.	**Project Work (PROJ)**	15 – 20 Credits
viii.	**Mandatory Learning Courses**	No Credits

(b) **M.Tech. Programme:** The M.Tech. Programme shall consist of courses and each course shall be assigned with credits. The Minimum credit requirement for the M.Tech. degree is 88. The total course of an M.Tech. degree programme will typical consists of

i.	**Core Courses**	30 – 35 Credits
ii.	**Elective Courses**	15 – 20 Credits
iii.	**Industrial Training / Seminar / Term Paper**	10 – 15 Credits
iv.	**Project Work (PROJ)**	25 – 30 Credits

(c) **M.C.A. Programme:** The M.C.A. Programme shall consist of courses and each course shall be assigned with credits. The Minimum credit requirement for the M.C.A. and M.C.A. (Lateral) degree are132 and 88 respectively. The total course of a M.C.A. degree programme will typical consists of

i.	**Core Courses**	65 – 70 Credits
ii.	**Elective Courses**	25 – 30 Credits
iii.	**Industrial Training / Seminar / Mini Project**	05 – 10 Credits
iv.	**Project Work (PROJ)**	25 – 30 Credits

(d) **M.B.A. Programme:** The M.B.A. Programme shall consist of courses and each course shall be assigned with credits. The Minimum credit requirement for the M.B.A. degree is 100. The total course of a M.B.A. degree programme will typical consists of

i.	**Core Courses**	50 – 55 Credits
ii.	**Elective Courses**	20 – 25 Credits
iii.	**Field work / Internship / Seminar**	05 – 08 Credits
iv.	**Project Work (PROJ)**	15 – 20 Credits

6. ADMISSION OF STUDENTS

(a) **Admission to first year B.E. Programme:** 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 to first year B.E. Programs which may change from time to time by the Karnataka State Govt.

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. The 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.

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.

(b) **Admission to M.Tech. Programme:** The Candidates seeking admission to M.Tech. Programmes must fulfill the eligibility requirements stipulated by the Karnataka State Govt. at the time of admission.

Admission to M.Tech. Course shall be open for the candidates who have passed the prescribed qualifying examination with not less than 50% of the marks in aggregate. However, in the case of candidates belonging to SC / ST / Category-I, the aggregate percentage of marks in the qualifying examination shall not less than 45%.

There shall be a Post Graduate Common Entrance Test (PGCET)for admission of course conducted as per Karnataka State Government norms. The selection procedure for admission shall be based on the merit order of the candidates in the PGCET entrance examination.

The candidates, who are qualified in GATE examinations for the appropriate branch of engineering, shall be given priority and they are exempted from taking PGCET entrance examination. If sufficient GATE qualified candidates are not available, such seats shall be filled from amongst the candidates appeared for entrance examination in the order of merit.

Members of the Non-teaching / Research / Govt. Staff Assistants working in any engineering college recognized by AICTE either in the State of Karnataka or outside and who have put in a minimum of three years of teaching experience on full – time basis in Engineering colleges, Polytechnic institutions / any other institutions imparting Engineering education shall be eligible for admission of PG courses under sponsored quota, provided they are sponsored by the respective institutions / DTE. In case candidates are not available, candidates with minimum two years of teaching experience are allowed to the course against sponsored quota.

Members working in the State Government / Central Government / Quasi Government organizations / Public sector industries / Reputed private industries, shall also be eligible to seek admission to PG courses, provided they have put in a minimum of two years of working experience and shall be sponsored by the concerned organizations, against the sponsored quota.

The engineering graduates other than the graduates of any of the Universities of Karnataka State shall have to obtain eligibility certificate from the VTU to seek admission to M.Tech. Course of VTU.

The academic eligibility for admission is open to the M.Tech. Course to all the candidates who have passed B.E. / B.Tech. Examination (in relevant field) of VTU or any other university / institution or any other examinations recognized as equivalent are as follows:

i. M.Tech. in Civil Engineering

a. **M.Tech (Computer Aided Design of Structures)** – Bachelor's Degree in Civil Engineering / Construction Technology or

equivalent degree; AMIE in appropriate branch; GATE – Civil Engineering are eligible.

ii. M.Tech. in Computer Science & Engineering

a. **M.Tech (Computer Science & Engineering)** – Bachelor's Degree in Computer Science & Engineering / Information Science & Engineering / Electronics & Communication Engineering / Electrical & Electronics Engineering / Instrumentation Engineering / Telecommunication Engineering or equivalent degree; AMIE in appropriate branch; GATE – CS, EC, EE, IT, IN are e ligible.

b. **M.Tech (Computer Engineering)** – Bachelor's Degree in Computer Science & Engineering / Information Science & Engineering / Electronics & Communication Engineering / Electrical & Electronics Engineering / Instrumentation Engineering / Electronics & Telecommunication Engineering / Telecommunication Engineering or equivalent degree; AMIE in appropriate branch; GATE – CS, EC, EE, IT, IN are e ligible.

iii. M.Tech. in Electronics & Communication Engineering

a. **M.Tech (VLSI Design & Embedded System)** – Bachelor's Degree in Electronics & Communication Engineering / Electrical & Electronics Engineering / Instrumentation Engineering / Electronics & Telecommunication Engineering / Telecommunication Engineering / Bio – Medical Engineering / Medical E lectronics or equivalent degree; AMIE in appropriate branch; GATE –EC, EE, IN are eligible.

iv. M.Tech. in Mechanical Engineering

a. **M.Tech (CIM)** – Bachelor's Degree in Mechanical Engineering / Industrial & Production Engineering / Automobile Engineering / Manufacturing Engineering / Industrial Engineering & Management or equivalent degree; AMIE in appropriate branch; GATE –ME, PI are eligible.

b. **M.Tech (Machine Design)** – Bachelor's Degree in Mechanical Engineering / Industrial & Production Engineering / Automobile Engineering / Manufacturing Engineering / Industrial Engineering & Management or equivalent degree; AMIE in appropriate branch; GATE –ME, PI are eligible.

(c) Admission to M.C.A Programme:

The Candidates seeking admission to M.C.A. Programme 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 Post Graduate Common Entrance Test (PGCET). The eligibility requirements and admission procedure for admission to first year M.C.A Program may be changed from time to time by the Karnataka State Govt.

Admission to MCA course shall be opened for the candidates who have passed the prescribed qualifying examination with not less than 50% of marks in the aggregate of all the years of degree examinations. However, the relaxation in the case of candidates belonging to SC / ST is 5%. Also any other group classified by Government of

Karnataka for such purpose from time to time, the above aggregate percentage shall be introduced.

Admission is open to MCA course for all candidates who have passed Bachelor Degree of minimum three years duration or any other examinations recognized by Visvesvaraya Technological University (VTU) or other University / Institution or any other examination recognized as equivalent thereto. However he/she shall have studied Mathematics or Business Mathematics or Statistics or Business Statistics or Mathematics & Statistics or Computer Programming or Computer Science or Computer Applications either at degree level or at 10 + 2 level securing 50% of marks.

Direct Admission to Second Year (Lateral Entry): The Candidates seeking direct admission to the second year M.C.A. program must fulfill eligibility requirements and selection procedures shall be stipulated by Government of Karnataka. The Candidates who have passed 3 years duration examination in BCA, B.Sc. (I.T. / Computer Science) with Mathematics at 10 + 2 level or at Graduate Level and obtained an aggregate minimum of 50% marks taken together in all the subjects in all the years of the Degree Examination can seek admission to M.C.A programs through PGCET.

A Management Quota seats are also available subject to the availability of seats. The eligibility requirements and admission procedure for admission to first year M.C.A Programs may be changed from time to time by the Karnataka State Govt.

(d) Admission to M.B.A Programme:

Any graduates from a recognized university in India or by the Association of Indian Universities (AIU) considered equivalent, with a minimum of 50% aggregate marks for General Merit and 45% for SC / ST / Category – I candidates in the qualifying examination is eligible for admission. The eligibility requirements and admission procedure for admission to first year M.B.A Programs may be changed from time to time by the Karnataka State Govt.

The Candidates from Karnataka state seeking admission to M.B.A. Programmes 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 Post Graduate Common Entrance Test (PGCET). The candidates who have qualified in MAT / CAT / XLRI / CMAT other recognized authorities can also seek admission.

The Candidates from outside Karnataka seeking admission to M.B.A. Programmes must fulfill the eligibility requirements stipulated by the Karnataka State Govt. at the time of admission. The candidates who have qualified in MAT / CAT / XLRI / CMAT other recognized authorities can also seek admission.

Migration certificate is necessary for the students who have completed their degree in universities other than VTU, Belagavi.

7. ACADEMIC CALENDAR

Each academic year shall be divided into.

(a) Two main semesters.

(b) One Supplementary semester; Students have to reregister for failed subjects, provided the college offers such subjects.

The breakdown of an academic year for implementing the *Semester Scheme* is given in Table 2 as a typical example:

Table 2: A Typical Breakdown of Academic Year into Semesters

1.	**Number of Semesters/Year**	Three; Two being Main Semesters *(Odd, Even)* and one being a Supplementary Semester at the end of Even semester. *(Note: Supplementary Semester is primarily to assist the* slow learners *and/or repeater students for repeating the courses. However, the slot can be used for other students and/or for deputing them for field work and/or internship.)*
2.	**Semester Durations (Weeks)**	Main Semesters *(Odd/Even): 20* each. Supplementary Semester: *9*.
3.	**A Typical Calendar**	**Main Semesters *(Odd/Even):*** Registration of Courses- 0.5; Course Work- 15.5; Practical Examination-1.0; Examinations- 2.0; Declaration of Results- 1.0; *Total: 20.* **Supplementary Semester (For Repeat Courses):** Registration of Courses- 0.2;Course Work- 5.5; Practical Examination-1; Examination-2.0; Declaration of Results-0.3; *Total: 9.* **Inter-Semester Recess:** After each Main Semester– 1 *to 2, flexible.* After Supplementary Semester– *1 to 2, flexible.* *(Note: In each Semester, there shall be various provisions for students like, Registration of Courses at the beginning, Dropping of Courses in the middle and Withdrawal from Courses towards the end, all being under the Faculty Members' advice. These facilities are required to ensure proper monitoring of students by Faculty Advisors, leading to their improved learning capabilities and minimizing their chances of failure in the Courses registered.)*
4.	**Examination**	Continuous Internal Evaluation *(CIE)* and Semester End Examination *(SEE),* both having equal weightages in the students' performance in Course Work/Laboratory Work and other activities.

8. CREDIT SYSTEM

8.1. General:

(a) As the *Credit System* has many advantages over the conventional system of organizing academic programmes, it is necessary to introduce an appropriate *Choice Based Credit System (CBCS)* for the various programmes at PESCE. This will be of great benefit to the students in their preparations to meet the challenging opportunities ahead.

(b) ***Credit Definition:*** One credit shall be equal to

Theory course: One hour of Teaching per week per semester;

Laboratory course / Tutorial: 2 hours per week per semester

8.2. Credit Structure

A typical *Credit Structure* for coursework based on the above definition is given in Table 3. This shall be applicable for the coursework of students registered for UG and PG Programmes at the College.

Table 3: Typical Credit Structure for Course Work

Lectures (L) (Hours/Week/Semester)	Tutorials (T) (Hours/Week/Semester)	Laboratory Work (P)(Hours/Week/Semester)	*Credits* (L:T:P)	*Credits* (Total)
4	0	0	4:0:0	4
3	2	0	3:1:0	4
3	0	0	3:0:0	3
2	2	0	2:1:0	3
2	0	2	2:0:1	3
2	2	2	2:1:1	4
0	0	6	0:0:3	3

9. REGISTRATION

9.1. 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.

9.2. Late Registration

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

9.3. 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 HoD, finally should be approved by Dean (Academic).

9.4. 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 21.

9.5. (i) 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 supplementary 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.

(ii) Registration for detained course/s

Students detained for entire academic year for not fulfilling eligibility criteria for upward movement as per section 22 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 and attendance.

(iii) 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.

(iv) 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.

9.6. Students who wish to reject prescribed courses of a particular semester/academic year, as per

Section14, 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.

9.7 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 16. The maximum number of credits for which a student can register is 25. However the student is advised to register for an average of 22 credits in each semester.

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

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

9.10. 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.

10. ATTENDANCE REQUIREMENT

10.1. 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.

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

10.3. 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.

11. FACULTY ADVISORS / MENTORS

Teachers shall be appointed as faculty advisors by the respective Head of the Department for groups of students. The functions of such advisors shall include:

(a) Monitoring the academic and other general progress of the students.

(b) Advising them on registration and selection of courses.

(c) Assessing their academic performance and monitoring their attendance.

(d) Advising the students on Withdrawing / Dropping of course/s based on their progress and capabilities.

12. DROPPING OF COURSES

A specific time period shall be fixed e.g., in the middle of a semester for this purpose to be based on the review to be conducted of students' performance in CIE by the Faculty Advisors concerned. The review is to mainly assist the students having poor performance to be facilitated to *drop* the identified course(s) (up to the *minimum credits* specified for the semester) without being mentioned in the *Grade Card.* Such Courses are to be re-registered by these students and taken up for study at a later semester in the programme.

13. WITHDRAWAL FROM COURSES

A specific time period shall be identified towards the end of a semester to help review the students' performance in CIE by the Faculty Advisors, followed by the students having poor performance to *withdraw* from identified course(s) (up to the *minimum credits* specified for the semester) with mention in the *Grade Card* (Grade 'W'). Such Courses to be re-registered by these students and taken up for study at a later semester in the programme.

14. TEMPORARY WITHDRAWAL FROM THE PROGRAMME

A student shall be permitted to withdraw temporarily from a College under the University on grounds like, prolonged illness, grave calamity in the family or any other serious happening. The withdrawal shall be for periods which are integral multiples of a semester, provided that:

(i) The student applies to the College within at least 6 weeks of the commencement of the semester or from the date he/she last attended the classes, whichever is later, stating fully the reasons for such a withdrawal, together with supporting documents and endorsement of his/her parents / guardians.

(ii) The College is satisfied of the genuineness of the case and that, even by taking into account the expected period of withdrawal, the student has the possibility to complete the prescribed programme requirements within the time limits specified by the University.

(iii) The student does not have any dues or demands at the College/ University including tuition and other fees as well as library material.

(a) A student availing of temporary withdrawal from an Autonomous College under the above provision shall be required to pay such fees and/or charges as may be fixed by the College until such time as his/her name appears on the Students' Roll List. However, it may be noted that the fees/charges once paid shall not be refunded.

(b) Normally, a student will be entitled to avail of the temporary withdrawal facility only once during his/her studentship of the programme at the

College. However, any other concession for the student shall have to be approved by the Academic Council of the College. Hence, the students shall be advised by the Principal of the College to use the above provision only in exceptional cases.

15. Termination from the Programme

A student shall be required to withdraw from the programme and leave the Autonomous College on the following grounds:

(i) Failure (Getting F Grade) and not passing a Course to earn credits for the same, in spite of **five** attempts.

(ii) Failure to secure *CGPA* ≥5.00 on three consecutive occasions to lead the student being asked to discontinue the programme and leave the College. However,

a *Failure to secure a CGPA ≥ 5.00 at the end of any semester for the first time, to attract warning before approval of the student to continue in the following semester (on probation).*

b There shall be a provision for the rejection of total performance of a semester and re-registration for the semester. This shall be done only once in the entire course of studies.

(iii) Absence from classes for more than six weeks at a time in a semester without leave of absence being granted by the competent Authority.

(iv) Failure to meet the standards of discipline as prescribed by the College from time to time.

16. CHANGE OF BRANCH AND INSTITUTION

16.1. 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.

16.1.1. 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.

16.2. 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.

17. ASSESSMENT

17.1. Assessment shall be done in two stages:

(a) Continuous Internal Evaluation (CIE): The CIE shall be conducted by the course teacher all through the semester; which shall include two written tests and two events such as quiz, assignments, problem solving, group discussions etc. The student shall secure a **minimum of 40%** of the total marks prescribed for the CIE in each course to become eligible for SEE.

Performance in laboratory courses shall be assessed by continuous internal evaluation, followed by a laboratory test by internal examiners.

(b) Semester-End Examination (SEE): shall be conducted by the course teacher at the end of a semester, on dates fixed by the College by means of a written examination for all core and elective theory courses.

17.2. Passing Standards: Passing standards are as mentioned in Table 4.

Table 4: Passing Standards using Absolute Grading

Evaluation Method	Passing Standard
CIE	Score: ≥40%
SEE	a. Score: ≥ 40% b. The total of CIE + SEE shall be ≥ 40%

17.3. Project Work Evaluation: CIE of the project work of UG and PG Courses shall be based on the progress of the student in the work assigned by the project supervisor, periodically evaluated by him/her together with a Departmental Committee constituted for this purpose.

Seminar presentation, project report evaluation and final oral examination shall be conducted by a common Project Evaluation Committee (with one external examiner for PG project report evaluation only). The detailed evaluation procedures shall be obtained from the respective departments.

In case of other requirements, such as, Seminar, Industrial Training, Field Work, Comprehensive Viva-Voce, if any, and Project Work for the PG Courses, the assessment shall be based on norms laid down by the Academic Council of the College as approved by the Governing Council.

17.4. There shall be no re-examination (Make-Up) for any Course except in the case of a student being awarded I or X grade. In such cases, the make-up examination shall be conducted immediately after SEE.

17.5. The following category of students are required to reregister for the course:

(a) Students who have failed to get letter grades - S A B C D E

(b) Students who have failed to secure a minimum of 40% marks in CIE.

(c) Students who have been detained on account of shortage of attendance

(d) Students who have withdrawn (Grade W) from a Course.

(e) Students who have dropped from a course/courses. Such students shall go through CIE and SEE again, in the course/courses for which he/she registers.

17.6. The re-registration shall be possible if the particular Course is offered again either in a main or a Supplementary Semester.

18. GRADING

Absolute grading system shall be adopted. The total marks scored by the students in CIE and SEE put together shall be converted into letter grades.

18.1. Letter Grades: A letter grade is basically a qualitative measure of the performance of a student in a course. The following letter grades shall be awarded to the students:

Outstanding (S), Excellent (A), Very Good (B), Good(C), Average (D), Poor (E) and Fail (F).

18.2. Transitional Grades: The transitional grades, such as, 'I', 'W' and 'X'shall be awarded to a student in special cases. These shall be converted into one or the other letter grades (S-F) after the student completes his/her Course requirements, including examinations:

18.2.1. Grade 'I': Awarded to a student having prescribed attendance and meeting the prescribed passing standard at CIE in a Course, but has absented from SEE with prior written permission, for a valid and convincing reason acceptable to the College, like:

(i) Illness or accident, which disabled him/her from attending SEE;

(ii) A calamity in the family at the time of SEE, which required the Student to be away from the College;

(iii) Any other emergency as ascertained by the competent authority.

18.2.2. Grade 'W': Awarded to a student having the prescribed attendance, but withdrawing from that Course before the prescribed date in a semester under faculty advice with the approval of the Head of the department.

18.2.3. ***Grade 'X':*** Awarded to a student having high CIE rating (≥ 90%) in a Course, but SEE performance observed to be poor, which could result in an overall F Grade in the Course.

18.3. Make-up Examination: The *Make-up Examination* facility shall be available to the students who may have missed to attend the SEE of one or more Courses in a semester for valid reasons and given the 'I' grade. Students having the 'X' grade shall also be eligible to take advantage of this facility. The *Make-up Examination* shall be held as per dates notified in the Academic Calendar. However, it will be possible for a College to hold this examination at any other time in the semester with the permission of its Academic Council. In all these cases, the standard of the *Make-up Examination* shall be the same as that of the regular SEE for the Courses.

18.4. Letter Grade and Grade Points:

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 + Alternative Assessment Tool shall form CIE of 50 marks. *(Note: Alternative Assessment Tool shall be like Unit Test / Mini-Projects / Seminar / MOOC's etc.)*
II - Test	Syllabus coverage is next 40%. (35 marks) There will be quiz along with test (5 marks)	
Assignment from Self Study Component	5 marks	
Alternative Assessment Tool	5 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 20 marks only.

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.

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).

The college follows a 10-point grading system, as given in Table 5.

Table 5: Grade Points Scale for Absolute Grading

Letter Grade	Grade – Points	Raw Score	Remark
S	10	≥ 90%	Outstanding
A	09	< 90& ≥ 80%	Excellent
B	08	< 80 & ≥ 70%	Very Good
C	07	< 70 & ≥ 60%	Good
D	06	< 60 & ≥ 50%	Average
E	04	< 50 & ≥ 40%	Poor
F	00	< 40 %	Fail
PP (For Non-credit courses)			Passed
NP (For Non-credit courses)			Not passed

The grade points given in Table 5 shall be used in the evaluation of credit points earned by the student in a Course. These credit points shall be used to calculate the SGPA and CGPA.

18.5. Earning of Credit: A student shall be considered to have completed a Course successfully and earned the credits if he/she secures an acceptable letter grade in the range S, A, B, C, D, E. Letter grade 'F' in any Course implies failure of het student in that Course and no credits earned.

18.6. 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:

$$\text{SGPA} = \frac{\sum [(\text{Course credit}) \times (\text{Grade point})]}{\sum [(\text{Course credits})]}$$

(For all courses that semester excluding transitional grades)

(For all the courses in that semester excluding transitional grades)

CGPA is computed as follows:

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

18.7. Award of Class: It is necessary to provide equivalence of the average of SGPA and CGPA with the percentages and/or Class awarded as in the conventional system of declaring the results of University examinations. This shall be done by prescribing certain specific thresholds in these averages for declaring First Class with Distinction, First Class and Second Class, as given in Table 6 as per AICTE guide lines.

Table 6: Percentage Equivalence of Grade Points (on a 10-Point Scale) as per AICTE

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

CGPA Conversion to Percentage Marks Equivalent percentage = (CGPA - 0.75) x 10

19. GRADE CARD

19.1. Each student shall be issued a Grade Card at the end of each semester.

19.2. The Grade Card shall have a list of all the Courses registered by a student in the semester together with their credits.

19.3. Credits for subjects with transitional grades such as W, X and I will be taken into calculation of SGPA and CGPA on their conversion to one of the letter grades S,A,B,C,D,E and F

19.4. The courses taken for audit will not be accounted for the computation of SGPA and CGPA

19.5. The results of mandatory courses, which are of the noncredit type, shall also be reflected in the Grade Card as PP (for Passed) or NP (for Not Passed). It may be noted that a student shall

have to obtain the grade PP in each such mandatory course to qualify for the award of Degree during his/her course of study.

20. 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 finalized 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.

21. APPEAL 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, Make-up and Supplementary Examinations answer script viewing are also permitted.

22. Eligibility criteria for upward movement

i. B.E. Programme Eligibility criteria for upward movement

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)#
IV	--
V	Can carry maximum of four incomplete courses from previous three semesters (II, III# & IV#) and, completed all courses of 1st semester
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
VIII	--

 # Excluding one credit courses and mandatory learning courses

ii. M.C.A. Programme Eligibility criteria for upward movement

Students are eligible to register following semesters with the conditions mentioned below.

Semester	Eligibility Criteria
First	--
Second	--
Third	Can carry maximum of four incomplete courses from previous 2 semesters #
Fourth	--
Fifth	Can carry maximum of four incomplete courses from previous 3 semesters and should have completed all courses of I semester and should have fulfilled conditions mentioned in section 4.4.4 #
Sixth	--

 # Excluding one credit courses

23. 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.

23.1. 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.

23.2. Award of Prizes, Medals and 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.

The total number of ranks awarded shall be 10 or 10% of total number of candidates appeared in final semester whichever less in that branch. In case, if there is less than 10 students appeared in the final semester examination then only one rank will awarded from that branch.

In case of fractional number of ranks, it is rounded to higher integer only when the first decimal place value is greater than or equal to 5.

For award of rank in a specialization of B.E. programme, the CGPA secured by the students from III to VIII Semester is considered. In case of PG programmes, the CGPA secured by the students from first to final semester is considered.

Ranks are awarded based on the merit of the students as determined by CGPA. If two or more students get the same CGPA, the tie shall be resolved by considering the actual marks obtained by the student. If it is not resolved even at this stage, the number of times a student has obtained higher SGPA. If it is not resolved still at this stage, the number of times a student has obtained higher grades like S, A, B, etc., shall be taken into account to decide the order of the rank.

A student shall be eligible for a rank at the time of award of degree, provided the student,

i. Has passed first to final semester in all the courses in first attempt only in case of students admitted in first year.
ii. Has passed third to final semester in all the courses in first attempt only in case of students admitted under lateral entry scheme.
iii. Has completed all the prescribed Audit / Mandatory Courses.
iv. Is not a repeater in any semester because of rejection of result of a Semester / Shortage of attendance etc.
v. Has completed all the semester without any break / discontinuity.

The following types of students are not consider for the rank,

i. Students who dropped the course in any semester.
ii. Students who wrote Make-up / Supplementary exams in any semester.
iii. Students who have N / I / W / X / F grade in a course in any semester.

24. 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.

25. Not withstanding situations and special cases covered by the above regulations the competent authority shall take decisions and obtain ratification from the immediate next Academic Council.

Scheme and Syllabus (1st year)

(Common to all Branches)

(With effect from 2018-19 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

P.E.S. COLLEGE OF ENGINEERING, MANDYA

(An Autonomous Institution)

Bachelor of Engineering

Scheme of Teaching and Examination [CBCS with OBE]

I – Semester [Physics Group]

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week			Credits	Examination Marks		
				L	T	P		CIE	SEE	Total
1	P18MA11	Engineering Mathematics - I	MA	4	-	-	4	50	50	100
2	P18PH12	Engineering Physics	PH	4	-	-	4	50	50	100
3	P18CV13	Engineering Mechanics	CV	3	-	-	3(4)	50	50	100
4	P18ME14	Elements of Mechanical Engineering	ME	3	-	-	3	50	50	100
5	P18EE15	Basic Electrical Engineering	EE	3	-	-	3	50	50	100
6	P18MEL16	Basic Mechanical Engineering Science Laboratory	ME	-	-	3	1.5	50	50	100
7	P18PHL17	Engineering Physics Laboratory	PH	-	-	3	1.5	50	50	100
8	P18HU18	Effective Communication Development (ECD)	HM	-	2	-	1(nil)	50	50	100
9	P18HM19	#Indian Constitution, Human Rights & Professional Ethics (ICHRPE)	HM	2	-	-	-	(50)	-	-
		Total					**21**	**400**	**400**	**800**

MA : Mathematics;PH : Physics; CV :Civil Engg; ME : Mech, Engg; EE: E & E Engg; HM : Humanities;

#ICHRPE :- Students shall have to pass these Mandatory Learning Course/s before completion of IV Semester.

I – Semester [Chemistry Group]

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week			Credits	Examination Marks		
				L	T	P		CIE	SEE	Total
1	P18MA11	Engineering Mathematics - I	MA	4	-	-	4	50	50	100
2	P18CH12	Engineering Chemistry	CH	4	-	-	4	50	50	100
3	P18CS13	C and Basics of Python programming	CS	3	-	-	3	50	50	100
4	P18MED14	Computer Aided Engineering Drawing	ME	1	-	4	3	50	50	100
5	P18EC15	Basic Electronics	EC	3	-	-	3	50	50	100
6	P18CSL16	C and Basics of Python programming Laboratory	CS	-	-	3	1.5	50	50	100
7	P18PCHL17	Engineering Chemistry Laboratory	CH	-	-	3	1.5	50	50	100
8	P18HU18	Effective Communication Development (ECD)	HM	-	2	-	1	50	50	100
9	P18EV19	#Environmental Studies	CV	2	-	-	-	(50)		-
10	P18HM110	#Language (Kan.)	HM	2	-	-	-	(50)		-
		Total					**21**	**400**	**400**	**800**

MA : Mathematics;CH : Chemistry; CV :Civil Engg; ME : Mech, Engg;CS : Comp. & Engg; EC: E & C Engg; HM : Humanities

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

II – Semester [Physics Group]

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week			Credits	Examination Marks		
				L	T	P		CIE	SEE	Total
1	P18MA21	Engineering Mathematics – II	MA	4	-	-	4	5 0	50	100
2	P18PH22	Engineering Physics	PH	4	-	-	4	50	50	100
3	P18CV23	Engineering Mechanics	CV	3	-	-	3	50	50	100
4	P18ME24	Elements of Mechanical Engineering	ME	3	-	-	3	50	50	100
5	P18EL25	Basic Electrical Engineering	EE	3	-	-	3	50	50	100
6	P18MEL26	Basic Mechanical Engineering Science Laboratory	ME	-	-	3	1.5	50	50	100
7	P18PHL27	Engineering Physics Laboratory	PH	-	-	3	1.5	50	50	100
8	P18HU28	Professional Communication Development (PCD)	HM	-	2	-	1	50	50	100
9	P18HM29	#Indian Constitution, Human Rights & Professional Ethics(ICHRPE)	HM	2	-	-	-	(50)	-	-
		Total					**21**	**400**	**400**	**800**

MA : Mathematics; PH : Physics; CV :Civil Engg; ME : Mech, Engg; EE: E & E Engg; HM : Humanities;

#ICHRPE :- Students shall have to pass these Mandatory Learning Course/s before completion of IV Semester.

II – Semester [Chemistry Group]

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week			Credits	Examination Marks		
				L	T	P		CIE	SEE	Total
1	P18MA21	Engineering Mathematics – II	MA	4	-	-	4	5 0	50	100
2	P18CH22	Engineering Chemistry	CH	4	-	-	4	50	50	100
3	P18CS23	C and Basics of Python programming	CS	3	-	-	3	50	50	100
4	P18MED24	Computer Aided Engineering Drawing	ME	1	-	4	3	50	50	100
5	P18EC25	Basic Electronics	EC	3	-	-	3	50	50	100
6	P18CSL26	C and Basics of Python programming Laboratory	CS	-	-	3	1.5	50	50	100
7	P18PCHL27	Engineering Chemistry Laboratory	CH	-	-	3	1.5	50	50	100
8	P18HU28	Professional Communication Development	HM	-	2	-	1	50	50	100
9	P18EV29	#Environmental Studies	CV	2	-	-	-	(50)	-	-
10	P18HM210	#Language (Kannada)	HM	2	-	-	-	(50)	-	-
		Total					**21**	**400**	**400**	**800**

MA : Mathematics;CH : Chemistry; CV :Civil Engg; ME : Mech, Engg;CS : Comp. & Engg; EC: E & C Engg; HM : Humanities

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

III – Semester

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week			Credits	Examination Marks		
				L	T	P		CIE	SEE	Total
1	P18MA31	+/++ Engineering Mathematics - III	MA	4	-	-	4	50	50	100
2	P18XX32	Core Course - I	XX	4	-	-	4	50	50	100
3	P18XX33	Core Course - II	XX	4	-	-	4	50	50	100
4	P18XX34	Core Course - III	XX	4	-		4	50	50	100
5	P18XX35	Foundation Course - I	XX	2	2	-	3	50	50	100
6	P18XXX36	Laboratory - I	XXX	-	-	3	1.5	50	50	100
7	P18XXX37	Laboratory - II	XXX	-	-	3	1.5	50	50	100
8	P18HU38	#Aptitude and Reasoning Development - Basics (ARDB)	HM	2	-	-	-	50	-	-
9	***P18HUDIP39***	****Comprehensive Communication Development (CCD)***	***HM***	***2***	**-**	**-**	***[2]***	***[50]***	***[50]***	***[100]***
10	*P18HUDIP310*	**Indian Constitution, Human Rights & Professional Ethics (ICHRPF)*	*HM*	*2*	-	-	-	*(50)*	-	-
11	*P18MADIP31*	**Additional Mathematics - I*	*MA*	*4*	-	-		*(50)*	-	-
		Total					**22** *[24]*	**350** *[400]*	**350** *[400]*	**700** *[800]*

**** CCD / ICHRPF / Additional Mathematics-I: Lateral entry (i.e. Diploma) students shall have to pass these mandatory learning courses before completion of VI- Semester. CIE only for 50 marks.***

#ARDB: All students shall have to pass this 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)

IV – Semester

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week			Credits	Examination Marks		
				L	T	P		CIE	SEE	Total
1	P18MAAC41 /P18MAES41	+/++ Engineering Mathematics - IV	MA	4	-	-	4	50	50	100
2	P18XX42	Core Course - I	XX	4	-	-	4	50	50	100
3	P18XX43	Core Course - II	XX	4	-	-	4	50	50	100
4	P18XX44	Core Course - III	XX	4	-	-	4	50	50	100
5	P18XX45	Foundation Course - II	XX	2	2	-	3	50	50	100
6	P18XXX46	Laboratory - I	XXX	-	-	3	1.5	50	50	100
7	P18XXX47	Laboratory - II	XXX	-	-	3	1.5	50	50	100
8	P18HU48	Aptitude and Reasoning Development - Intermediate (ARDI)	HM	2	-	-	1	50	50	100
9	*P18EVDIP49*	**Environmental Studies*	*HM*	*2*	-	-	-	*(50)*	-	-
10	*P17MADIP41*	**Additional Mathematics - II*	*MA*	*4*	-	-		*(50)*		
		Total					**23**	**400**	**400**	**800**

**** Additional Mathematics-II & Environmental Studies: Lateral entry (i.e. Diploma) students shall have to pass these mandatory learning courses before completion of VI- Semester. CIE only for 50 marks.***

+ Common to BE (AU, CV, ME and I&PE)

++ Common to BE (CS, EC, E&E and IS&E)

V – Semester

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week			Credits	Examination Marks		
				L	T	P		CIE	SEE	Total
1	P18XX51	Management and Entrepreneurship (The course must be related to Management and Entrepreneurship. However, the title and syllabus content can be as per the programme requirement).	XX	4	-	-	4	50	50	100
2	P18XX52	Core Course - I	XX	4	-	-	4	50	50	100
3	P18XX53	Core Course - II	XX	4	-	-	4	50	50	100
4	P18XX54	Core Course - III	XX	4	-	-	4	50	50	100
5	P18XX55X	Professional Elective - I	XX	2	2	-	3	50	50	100
6	P18XXX56	Laboratory - I	XXX	-	-	3	1.5	50	50	100
7	P18XXX57	Laboratory - II	XXX	-	-	3	1.5	50	50	100
8	P18XXX58	Skill Oriented Laboratory - I	XXX	-	-	2	1	50	50	100
9	P18HU59	Aptitude and Reasoning Development - Advance (ARDI)	HM	-	2	-	1	50	50	100
10	P18XX510	Technical Skills - I	XX	-	2	-	1	50	50	100
		Total					**25**	**500**	**500**	**1000**

Professional Elective - I

Sl. No	Course Code	Course title
1.	P18XX551	
2.	P18XX552	
3.	P18XX553	
4.	P18XX554	

VI – Semester

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week L	T	P	Credits	Examination Marks CIE	SEE	Total
1	P18XX61	Core Course - I	XX	4	-	-	4	50	50	100
2	P18XX62	Core Course - II	XX	4	-	-	4	50	50	100
3	P18XX63	Core Course - III	XX	4	-	-	4	50	50	100
4	P18XX64X	Professional Elective - II	XX	2	2	-	3	50	50	100
5	P18XX65X	Open Elective-I	XX	3	-	-	3	50	50	100
6	P18XXX66	Laboratory - I	XXX	-	-	3	1.5	50	50	100
7	P18XXX67	Laboratory - II	XXX	-	-	3	1.5	50	50	100
8	P18XXX68	Skill Oriented Laboratory	XXX	-	-	2	1	50	50	100
9	P18XX69	Technical Skills - II	XX	2	-	-	1	50	50	100
Total							**23**	**450**	**450**	**900**

List of Electives

Professional Elective - II			Open Elective – I		
Sl. No	**Course Code**	**Course title**	**Sl. No.**	**Course Code**	**Course title**
1.	P18XX641		1.	P18XX651	
2.	P18XX642		2.	P18XX652	
3.	P18XX643		3.	P18XX653	
4.	P18XX644		4.	P18XX654	

VII – Semester

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week L	T	P	Credits	Examination Marks CIE	SEE	Total
1	P18XX71	Core Course - I	XX	4	-	-	4	50	50	100
2	P18XX72	Core Course - II	XX	4	-	-	4	50	50	100
3	P18XX73	Core Course - III	XX	4	-	-	4	50	50	100
4	P18XX74X	Professional Elective - III	XX	2	1	-	3	50	50	100
5	P18XX75X	Open Elective - II	XX	3	-	-	3	50	50	100
6	P18XXX76	Laboratory - I	XXX	-	-	3	1.5	50	50	100
7	P18XXX77	Laboratory - II	XXX	-	-	3	1.5	50	50	100
8	P18XX78	Project Work Phase – I and Project semina r	XXX	-	-	4	2	100	-	100
Total							**23**	**450**	**350**	**800**

List of Electives

Professional Elective - III			Open Elective – II		
Sl. No	**Course Code**	**Course title**	**Sl. No.**	**Course Code**	**Course title**
1.	P18XX741		1.	P18XX751	
2.	P18XX742		2.	P18XX752	
3.	P18XX743		3.	P18XX753	
4.	P18XX744		4.	P18XX754	

VIII – Semester

Sl. No.	Course Code	Course Title	Teaching Department	Hrs / Week L	T	P	Credits	Examination Marks CIE	SEE	Total
1	P18XX81	Core Course	XXX	4	-	-	4	50	50	100
2	P18XX82X	Professional Elective - IV	XXX	2	1	-	3	50	50	100
3	P18XX83	Internship	XXX			-	2	50	-	50
4	P18XX84	Project Work Phase – II	XXX	-	-	-	6	100	100	200
5	P18XX85	Self study course & Seminar	XXX	-	-	4	2	50	-	50
Total							**17**	**300**	**200**	**500**

Professional Elective - IV

Sl. No	Course Code	Course title
1.	P18XX821	
2.	P18XX822	
3.	P18XX823	
4.	P18XX824	

Category of Courses & Components:

1. **Core Courses:** The Core courses constitute the core of the programme of study. Core courses are to be compulsorily studied by a student and are mandatory to complete them to fulfill the requirements of a programme.
2. **Foundation Courses:** Foundation courses constitute the fundamental learning of a given programme of study. Generally, they comprise courses such as basic & life sciences, logic & mathematics, statistics & analytics, basic engineering, technical arts and computer programming skills.
3. **Professional Electives:** Professional Elective courses offer a choice of advanced or specialized courses related to the programme of study. They enable students to specialize in a domain of interest or tune their learning to suit career needs and current trends.
4. **Open Electives:** 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.

Note to Students:

I. All B.E Program students should study one Open elective each in the VI and VII Semester as a part of their Programme.

II. Students should register for the Open elective in the beginning of the VI/VII semester in the department, where the elective is offered. An Open elective is not offered in a department if the registered student's strength is less than 20.

III. All Open electives are offered to students of all B.E Programmes (branches) of engineering in general. However, if a student of a particular Programme has already studied/going to study, in higher semester a similar Core course with majority of topics same as that of a particular Open elective, then that Open elective is not offered to that student. In which case, the student has to select an alternative Open elective.

IV. Having studied/selected a particular Open Elective, a student is not eligible to take a Professional elective of his/her Programme in the higher semesters / same semester which will have majority of topics same as that of the Open elective studied / selected. In which case, the student has to select an alternative Professional elective.

V. Students are advised to select an Open elective of their interest and if they have a pre requisite knowledge to study that particular open elective.

Note to Departments:

I. Above conditions are to be monitored by an Open elective coordinator of the department to which the student belongs to and the Course coordinator of the department where the student registers for the Open elective in the beginning of the VII / VIII semester.

II. The Teaching department(s) for Open Elective is not restricted to only those departments(s) indicated in the list. Any other department faculty who has the requisite expertise to teach a particular Open elective can also teach it.

III. Offering department indicated in the list of Open electives is the department which is responsible to set the Syllabus and Question paper for the particular Open elective.

5. 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 i.e. Massive Open Online Course (***MOOC***) NPTEL Courses. 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 (CIE) 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 by the committee for award of Assessment marks (CIE) based on a Report, presentation and viva voce.

6. Internship: The Internship shall be completed during the period specified in the Scheme of Teaching and Examination.

I. Internship is of minimum eight weeks duration and to be completed between the vacation period of VI – VII semester and VII - VIII semester.

II. The internship can be carried out in any industry/ R & D Organization/ Research / Institute/ Educational institute of repute / Internshala (AICTE MoU Internship).

III. The Department/college shall nominate staff member/s to facilitate, guide and supervise students under internship.

IV. The Internal Guide has to visit place of internship at least once during the student's internship.

V. The students shall report the progress of the internship to the guide in regular intervals and seek his/her advice.

VI. After the completion of Internship, students shall submit a report with completion and attendance certificates to the Head of the Department with the approval of both internal and external guides.

VII. There will be 50 marks for CIE (Seminar: 20, Internship report: 20 and Viva – Voce: 10 marks). The minimum requirement of CIE marks shall be 50% of the maximum marks.

VIII. The Assessment marks (CIE) in the case of Internship, shall be based on the evaluation 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. The Internship may be evaluated by the committee for award of Assessment marks (CIE) based on a Internship Report, Presentation and Viva-Voce.

IX. The students are permitted to carry out the internship anywhere in India or abroad. The Institution will not provide any kind of financial assistance to any student for carrying out the Internship.

X. **Failing to undergo Internship:** Internship is one of the head of passing. Completion of internship is mandatory. If any student fails to undergo /complete the internship, he/she shall be considered as failed in that Course. The reappearance shall be considered as an attempt.

7. Project Work: The Project Work (Phase I + Phase II) carries 8 credits (2 credits+6 credits) and spreads over TWO semesters, i.e. during 7th and 8th semesters.

I. **Project Phase – I and** Project seminar Comprises of Literature Survey, Problem identification, Objectives and Methodology. CIE marks shall be based on the report covering Literature Survey, Problem identification, Objectives and Methodology and seminar presentation skill.

II. The Assessment marks (CIE) 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 by the committee for award of Assessment marks (CIE) based on a Report [comprising of synopsis, Introduction, Literature survey, Objective and Methodology], presentation and viva voce.

III. 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.

IV. 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.

V. 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

VI. 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.

VII. 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 evalua tion. After the final evaluation, appropriate letter grade is awarded.

VIII. 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 proj ect, 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.

IX. 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).

X. The Assessment marks sheet shall bear the signature of all those concerned, along with the date and seal of the Principal.

8. Non-credit courses: A few courses may not be assigned credits. Such courses shall be referred to as non-credit (NC) courses, and may be mandatory in a programme of study. Certain programmes of study may have additional requirements such as apprenticeship and residency.

9. 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 unit's syllabus.

I. Assignment shall be reduced to 30 marks from 35 marks and the remaining 5 marks shall be part of the self-study component.

First and Second Semester Syllabus

Academic Year 2018-19

Department of Mathematics

About the Department:

The Department was started in the year 1962. Currently the Department has **09** 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 **07** candidates have been awarded Ph. D. degree. During the last five years, the Department has published **50** papers in international and **24** 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:P18MA11	**Sem: I**	**L-T-P-H: 4-0-0-4**	**Credits - 4**
Contact Period: Lecture: 52Hrs., Exam: 3 Hrs		**Weightage: CIE:50%; SEE:50%**	

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

Review of differential calculus**. Polar curves -** angle between the radius vector and the tangent, angle of intersection. Pedal equation (for polar curves)-problems only. Derivatives of arcs, curvature and radius of curvature- Cartesian, parametric, polar and pedal forms (No derivation)-Problems only. Center and circle of curvature: Applications to evolutes and involutes.

05+05=10 Hrs

Self study component-Calculation of n^{th} derivative of standard functions and Leibnitz's rule.

UNIT-II

Lagrange's and Cauchy's mean value theorem. (statem ents only) - Illustrative examples, Taylor's theorem for a function of single variable and Maclaurin's series expansion (statements only) – Illustr ative

examples. Indeterminate forms -L'Hospital's rule(wi thout proof), $0\times\infty$, $\infty-\infty$, 0^0, ∞^0 and 1^∞.

05+05=10 Hrs

Self study component- Rolle's Theorem & indeterminate forms 0/0 and ∞/∞.

UNIT-III

Partial differentiation - Introduction and Problem. 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. Vector identities (No proof) **06+06=12 Hrs**

Self study component- Euler's extension theorem and related problems, vector identities. Introduction and elementary problems of partial differentiation.

UNIT-IV

Reduction formulae for $\int\cos^n x$, $\int\sin^n x$, $\int\sin^m x\cos^n x$, and evaluation of these with standard limits. Differentiation under integral sign (integrals with constant limits). Tracing of curves and its applications connected with standard curves viz., Cissiod, Cycloid and Cardioid. Applications of integration to area, length of a given curve, volume and surface area of solids of revolution (Standard curves **05+05=10 Hrs Self study component-** Tracing of the curves – Astroid, Witch of agnesi, Strophoid, Lemniscate of Bernoulli.

UNIT-V

Introduction to ordinary differential equations (ODE's)-solutions of first order and first degree differential equations: exact, linear differential equations of order one and, equations reducible two 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. **06+04=10 Hrs**

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

Text Books:

1. B. S. Grewal: Higher Engineering Mathematics, 43rd Edition- 2015, Khanna Publishers, New Delhi.
2. Engineering Mathematics: N. P. Bali and Manish Goyal, Laxmi Publications, 7th Edition 2007.

Reference Books:

1. Advanced Engineering Mathematics: E. Kreyszig, John Wiley & Sons, 9th Ed. 2011.
2. G. B. Thomas and R. L. Finney, Calculus and analytic geometry. 9th edition, Pearson reprint, 2002.
3. Calculus- Early Transcendentals, James Stewart, 7th Edition, Cengage, 2012.

Course Outcomes (CO's)

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

CO1: Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.

CO2: Explain mean value theorems and evaluate the indeterminate form and power series using Taylors and Maclaurin's series.

CO3: Differentiate the function of several variables differentiate the composite function. Evaluate the vector differentiation.

CO4: Evaluate some standard integrals by applying reduction formula and solve application problems. Solve differential equations of first order and solve application problems in engineering field.

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. in different fields. The department is recognized for research in Physics under PET research center affiliated to University of Mysore, Mysore and VTU Belagavi. Dr. Shivalinge Gowda, Dr. T. S. Shashikumar are involved in research activities and Mr. B.M. Thammanna is pursuing Ph.D.

The department has good supporting Non-teaching staffs with one Assistant Instructor and three 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 conferences
- Establishment of research centre

Long Term Goals:

- Inter disciplinary research activities
- Establishing centre of excellence

Course Title: Engineering Physics			
Course Code: P18PH12/22	**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**		

The student should have acquire knowledge of Basic laws, principles, theories, phenomenon, definitions, expressions, applications, 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 related to engineering filed chosen by the student.

Course Content

Unit – I: Modern Physics and Quantum Mechanics: 8 hr + 2T hr = 10 hrs

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

b) Quantum Mechanics: Heisenberg's uncertainty principle and its applications (Non-existence of electrons in the nucleus). Wave function, properties, Physical significance of wave function and Normalization. Time-independent one dimensional Schrodinger's wave equation. Eigen functions and Eigen values. Applications of Schrodinger wave equation: 1. Free Particle and 2. Particle in one dimensional potential well of infinite height and finite width. Numerical Problems.
Self study component: Reduction of Rayleigh-Jeans law and Wein's law from Planck's law.

Unit – II: Elastic and Dielectric properties of Ma terials: 8 hr + 2T hr = 10 hrs

a) Elastic properties of Materials: Concept of stress, strain, tensile stress, shear stress, compressive stress, concept of elasticity, plasticity, strain hardening and strain softening, Hooke's law, different elastic moduli: Poisson's ratio and its limits. Expression for bending moment of a beam with rectangular cross section. Young's modulus (Y), Bulk modulus (K) and Rigidity modulus (n) in terms of α and β (Mention the expressions). Relation between Y, n, K and σ; Applications: I-shaped girders and Twisting Couple. Numerical problems.

b) Dielectric properties of Materials: Electric dipole, dipole moment, Dielectric constant and polarization of dielectric materials. Four types of polarization. Polar and non-polar dielectrics. Expression for internal fields in solids (one dimension). Expression for Clausius-Mossotti equation. Mention of solid, liquid and gaseous dielectrics with one example each. Applications of dielectrics in transformers. Numerical Problems.
Self study component: Rigidity modulus by torsional pendulum

Unit – III: Electrical Conductivity in Metals and S emiconductors: 8 hr + 2T hr = 10 hrs

a) Electrical Conductivity in Metals: Failures of classical free electron theory. Quantum free electron theory – Assumptions, Fermi Dirac Statisti cs (qualitative), Fermi level, Fermi temperature, Fermi velocity and Fermi factor. Variation of Fermi factor with Energy and temperature, Expression for density of states. Expression for Fermi energy. Merits of quantum free-electron theory. Numerical Problems.

b) Semiconductors: Classification of Semiconductors, Fermi level in intrinsic and extrinsic semiconductors. Expression for electron concentration in conduction band and Mention the expression for hole concentration in valance band of an intrinsic semiconductor. Relation between E_F and E_g. Expression for intrinsic carrier concentration and conductivity of an intrinsic semiconductor. Numerical Problems.
Self study component: Expression for energy gap of an intrinsic semiconductor by variation of resistivity with temperature.

Unit – IV: Lasers and Optical Fibers: 8 hr + 2T hr = 10 hrs

a) Lasers: Review of absorption, spontaneous and stimulated emission of radiation, Expression for energy density in terms of Einstein coefficients. Requisites of a Laser system: laser cavity, active medium and excitation source. Conditions for laser action: metastable state, population inversion and pumping process. Principle, Construction and Working of CO_2 and Semiconductor Lasers. Application of Lasers in range finder, data storage, welding and cutting. Numerical problems.

b) Optical fibers: Propagation mechanism. Expression for angle of acceptance and Numerical

aperture. Fractional index change, V number and number of modes. Types of optical fibers. Attenuation: Causes of attenuation. Expression for attenuation coefficient. Application of optical fibers in communication system. Numerical problems.

Self study component: Measurement of pollutants in the atmosphere using LASER.

Unit – V: Superconductivity and Theory of Sound: 8 hr + 2T hr = 10 hrs

a) Superconductivity: Temperature dependence of resistivity in superconductors. Meissner's effect, BCS theory. Types of Superconductors (Type-I and Type-II). High temperature superconductors. Applications of superconductivity – i) Superconduct ing magnets, ii) Maglev vehicle and iii) SQUIDS.

b) Theory of Sound:

Vibrations: Equation of motion for free vibrations, Theory of damped vibrations: overdamping, critical and under damping, quality factor. Theory of forced vibrations and resonance, Sharpness of resonance.

Acoustics: Absorption, reverberation and time of reverberation, Sabine's formula (Mention the expression), Basic requirements of the acoustically auditorium.

Ultrasonics: Non-destructive method of testing the materials. Measurement of ultrasonic velocity in solids and liquids. Applications of ultrasonics. Numerical Problems.

Self study component: Sound absorbing materials and factors affecting acoustics of buildings.

Text Books

1. John Wiley & Sons: Engineering Physics - Wiley India Pvt. Ltd, New Delhi.
2. R.K. Gaur, S. L. Gupta ; Engineering Physics – Dhan pat Rai Publications; 2011 Edition

References

1. S. O. Pillai : Solid State Physics, (New Revised Sixth Edition) – New Age International (P) Limited, Publishers, New Delhi.
2. N.H. Ayachit, P. K. Mittal: Engineering Physics – I. K. International Publishin g House Pvt. Ltd. New Delhi.
3. M.N. Avadhanulu and P.G. Kshirsagar; Engineering Physics – S Chand & Company Ltd., Ram Nagar, New Delhi.
4. D. R. Khanna, R. S. Bedi : A Text Book of Sound – Published by Atma Ram & Sons – 1981.

D. Course Outcomes (COs)

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

CO1 - **Understand** the **basic concepts** and **principles** of Physics describing the phenomena associated with Engineering field.

CO2 - **Explain/Describe** the **properties** of various materials, light and sound related to **Engineering applications**.

CO3 - **Formulate/Derive** the **Expressions** for the concepts of Physics pertaining to Engineering field**.**

CO4 - **Apply** the **knowledge** of Physics to **analyze/solve** the numerical problems allied to Engineering field.

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 de partment 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: P18CH12/22	**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 information's 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 te chnology is useless and technology without science is blind". Therefore the knowledge of scien ce is very essential for engineering students.

Course Content (CC)

Unit – I: Chemical fuels and Alternate fuels: 8 + 2 hrs

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, synthetic petrol by Bergius method.

Alternate fuels: Power alcohol, bio-diesel, and solar energy: photovoltaic cells, Introduction, definition, importance, working of PV cell, and production of solar grade silicon by puller technique method. Applications of solar energy.

Self-study component: Nuclear, Wind, Ocean energies, Tidal energy and Bio fuels

Unit – II: Electrochemistry and Battery Technology : 8 + 2 hrs

Electrode; Standard electrode potential, Derivation of Nernst equation, Numerical problems. Types of electrodes- Primary reference electrode-limitations and secondary reference **Electrodes**: Construction, working and applications of Calomel electrode and Glass electrode. Determination of pH and pKa value of a solution using glass electrode and calomel electrode.

Electrochemical Cells: Introduction, EMF of a cell, notation and sign conventions and numerical problems. Types of Electrochemical cells. Galvanic cell- Classification -primary and secondary cells.

Fuel cells: Introduction, construction, working and applications of H_2- O_2 and CH_3OH- O_2 fuel cells.

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

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: 8 + 2 hrs

Corrosion: Introduction, Electro Chemical theory of corrosion, Types - Differential metal corrosion, Differential aeration corrosion - pitting corrosion and Stress corrosion- Caustic embritlement. Factors affecting the rate of corrosion-Nature of metal, Nature of corrosion product, anodic and cathodic areas, pH and temperature.

Corrosion control: Selection of materials and Proper designing, Cathodic protection. Corrosion Inhibitors. Metal coating - Galvanization and Tinning.

Metal finishing: Introduction, Technological importance of metal finishing, Objectives of electro plating. Factors affecting the nature of electro-deposit. Electroplating of Au by cyanide process only neutral medium and Cr by Sulphate method. Differences between electro plating and Electro-less plating. Advantages of electro-less plating. Electro-less plating of Cu on PCB and Ni with applications.

Self-study component: Water line corrosion, Anodizing, phosphate, chromate coatings and Determination of metal ions concentration like Cu^{2+} and Fe^{3+} by colorimetric method.

Unit – IV: Material Science and Technology: 8 + 2 hrs

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

Elastomers: Synthesis and applications of silicon rubber, Butyl rubber, Thiokol and Nitrile rubber. Vulcanization and compounding of rubber

Adhesives: Synthesis and 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. Determination of CaO in cement solution by rapid EDTA method.

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

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

Unit –V: Liquid Crystals, Nano-Chemistry, Water Te chnology and Pollution: 10+2hrs

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, size dependent properties. Bottom up and top down approach. Distinction between molecules, nano-particles and bulk materials. nano-particles, nano-rod, nano-tubes and nano-wires, properties and applications. Synthesis of nano – materials by chemical vapour deposition.

Water Technology: Introduction, Impurities of water, International standards of drinking water, formation of scale and sludge, boiler scales and its ill effects. Treatment of boiler feed water by internal and external methods - ion exchange process. Desalination of water by Electro-dialysis and reverse osmosis processes. Purification of water for municipal supply.

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. Determination of total hardness of water. Sewage treatment-primary, secondary and tertiary.

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

Text books:

1. Uppal. M.M. Engineering Chemistry Khanna Publishers, 36Edition, 2017.
2. Jain and Jain, A text Book of Engineering Chemistry by Dhanapatrai Publications, New Delhi, 25st Edition, 2017.

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 2017.
2. B. K. Sharma. A Text Book of Environmental Chemistry and Industrial Chemistry by, Goel Publishing House, Meerut, 13th Edition 2017.
3. Murthy B.S, Shankar. P and Raju. B. A Text book of Nano-science and Nano- technology by Goel Publishing House, Meerut, 14th Edition 2017.
4. Wiley Engineering Chemistry and Engineering Chemistry by Dr. K. Pushpalatha, Wiley Publication, India, 3rd Edition 2017.

D. Course Outcomes (Course Learning Outcomes) (COs)

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

CO1- Aware and Recognize the importance of Chemical fuels and Alternate fuels.

CO2 - Describe the construction, working and applications of electrodes, cells, and batteries.

CO3 -Apply the knowledge of Chemistry to understand the mechanism and prevention of corrosion. Engineering applications of electro-plating and electro-less plating.

CO4 – Synthesis of various polymers and study their applications. Use of cement and lubricants in the field of engineering. **Acquiring** the knowledge of liquid crystals, nano science, water technology and water pollution.

Department of Civil Engineering

Course Title : Engineering Mechanics			
Course Code: P18CV13/23	**Semester : I/II**	**L-T-P-H: 3 – 0 – 0 - 3**	**Credits: 3**
Contact Period : Lecture :42 Hr, Exam: 3Hr		**Weightage :CIE:50% SEE:50%**	

Course Content

UNIT – I

INTRODUCTION: Basic idealization of mechanics, particle, rigid body, mass, time, continuum, force, force system, system of units, principle of transmissibility of forces, principle of superposition.
COPLANAR CONCURRENT FORCE SYSTEM: Resultant of forces. Resolution of forces, composition of coplanar concurrent, parallel and non-concurrent forces, Moment of a force, Varignon's theorem, free body diagram, equilibriant, equilibrium of particles and rigid bodies.

9 Hrs

Self-Learning: Application of triangle and polygon Law, vector method of resolution and composition of forces.

UNIT – II

SUPPORT REACTIONS: Types of loads and types of supports, statically determinant beams, numerical problems on support reactions for beams with point loads(normal and inclined), uniformly distributed load, uniformly varying load and moment.
FRICTION: Introduction, types of friction, laws of friction, angle of friction, angle of repose , cone of friction, characteristics of dry friction, application –body on horizontal plane and inclined plane and ladder friction. **9 Hrs *Self-Learning***: Numerical problems on support reaction of beams loaded with trapezoidal loads, Support reactions for Compound beams and wedge friction - numerical problems.

UNIT – III

CENTROID AND CENTRE OF GRAVITY: Introduction to centroid and centre of gravity, Centroid of rectangular, triangular, circle, semicircle, quarter circle lamina and sector from first principles. Numerical problems on Centroid of composite lamina. **8 Hrs *Self-Learning***: Determining Centroid for Composite Lamina with openings.

UNIT – IV

MOMENT OF INERTIA: Introduction, radius of gyration, parallel axis theorem, perpendicular axis theorem, polar moment of inertia, moment of inertia of standard geometrical figures by first principles. Numerical problems on moment of inertia of composite sections. **8 Hrs *Self-Learning***: Determining moment of Inertia of Composite sections with reference to given axis.

UNIT – V

DYNAMICS: Introduction to dynamics, Classification, linear and curvilinear motion- projectiles, centripetal and centrifugal forces, banking/superelevation.
Introduction to work, power and energy, impulse – n umerical problems. **8 Hrs *Self-Learning***: Concept of motion with varying acceleration. Collision of elastic bodies.

TEXT BOOKS:

1. S.S Bhavikatti, A text on elements of Civil Engineering and mechanics, New age international publishers, 2015.
2. R.S. Khurmi, A text book of Engineering mechanics, S. CHAND & COMPANY LTD.

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 and compute its resultant.
2. Analyse the system of forces in equilibrium with or without frictional forces.
3. Locate the centroid and composite moment of inertia of irregular and built up sections.
4. Analyse the problems with respect to linear motion, curvilinear motion and energy.

Department of Computer Science & Engineering

Course Title: C and Basics of Python programming			
Course Code:P18CS13/23	**Sem: I/II**	**L-T-P-H: 3-0-0-3**	**Credits: 3**
Contact Period: Lecture:42 Hrs, Exam: 3Hr		**Weightage: CIE:50%; SEE:50%**	

Course Content

Unit -1

Program 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. **9 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. **8 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. **8 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.

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

Unions: Union definition, Differences between structure and union. **8 Hours**

Unit – V

Basics of Python Programming

Features and History of python, Future of python, Literal constants, Data Types, Input Operation, Comments, Reserved Words, Operators and Expressions, Expressions in Python, Operations on Strings, Other Data Types, Type Conversion.

Decision Control Statements

Introduction**,** Selection/Conditional Branching Statements, Basic Loop Structures/ Iterative Statements, Nested Loops, The pass Statement, The else Statement used with Loops. **9 Hours**

Text Books:

1. Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill – 5 th Edition.
2. Python Programming Using Problem Solving Approach by Reema Thareja, Oxford University Press 2017.

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.
3. Fundamentals of Programming by Richard L. Halterman, Southern Adventist University 2018.

Course Outcomes:

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

1. Understand and Apply the knowledge of program construct in solving a problem.
2. Analyze the given scenario and write the suitable psudo code.
3. Design and Develop solution to a real time problem.

Department of Mechanical Engineering

Course Title: Elements of Mechanical Engineering			
Course Code: P18ME14/24	**Sem: I / II**	**L-T-P-H : 3-0-0-3**	**Credits: 3**
Contact Period: 52 Hr; Exam: 3 Hrs.		**Weightage: CIE:50%; SEE:50%**	

Course Content

Unit – 1

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**

Self Learning Component: Renewable and nonrenewable energy resources comparison.

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 Self Learning Component:** Working principle of MPFI and CRDI systems.

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**

Self Learning Component: Priming of pump, Split Air conditioner and centralized air condition system.

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 Self Learning Component:** Super finishing operations- lapping and honing.

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 Component: Bearings and lubrication- types of bearings, types and properties of lubricants.

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 Ele ments 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.

Course Title: Computer Aided Engineering Drawing			
Course Code: P18MED14/24	**Sem:I /II**	**L-T-P-H: 1-0-4-5**	**Credits-3**
Contact Period: 65 Hr; Exam: 3 Hrs.		**Weightage: CIE:50; SEE:50**	

Relevance of the course: 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.

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. **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, combination of two 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.

A. Evaluation Scheme				
Scheme	**Weightage**	**Marks**	**Event Break Up**	
CIE	50%	50	**Test**	**Submission**
Unit I & II to be evaluated only through CIE			20	30
SEE	50%	50	**Questions to be Set: 06**	**Questions to Answer: 03**

Scheme for Semester End Examination	
One out of two Questions from unit III	15 Marks
One out of two Questions from unit IV	20 Marks
One out of two Questions from unit V	15 Marks
Total	**50 Marks**

Department of Electrical & Electronics Engineering

Course Title: Basic Electrical Engineering			
Course Code: P18EE15/25	**Semester: I/II**	**L:T:P:H-3:1:0:4**	**Credits:3**
Contact period : Lecture: 40 Hrs., Exam 3 Hrs.		**Weightage : CIE:50; SEE:50**	

Course Content

Unit – I

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. **08Hrs**

Unit-II

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.

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

Self-Study: Different types of Wiring, advantages and disadvantages **08Hrs**

Unit – III

DC Machines: Types of Induced EMF: Statically & Dynamically induced EMF's, 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.

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: Applications of DC Motors **08Hrs**

Unit – IV

Transformers: Concept of Self Inductance, Mutual Inductance. Principle of operation and construction of single phase transformers (core and shell type), EMF equation. Transformer on no-load, power losses, efficiency, 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, Illustrative examples

Self-Study: Applications of transformers & Induction Motors **08Hrs**

Unit – V

Special Machines: Construction, working and applications of Brush Less DC motor (BLDC), Capacitor start capacitor run single phase Induction motor, Stepper motor, Servo motor.

Self-Study: Applications of Permanent magnetic DC motor **08Hrs**

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 Engine ering", 3 rd Edition, Prentice hall of India Pvt, Ltd, 2014
2. V N Mittle and ArvindMittle, "Basic Electrical Engi neering" 2 nd Edition, Tata McGraw Hill Publications,2005

Course Outcomes

After learning all the units of the course, the student is able to
CO1: Analyze single phase and three phase AC circuits.
CO2: Demonstrate their understanding about earthing and different types of wiring.
CO3: Demonstrate their understanding about different types of measuring instruments and their usage.
CO4: Identify and analyse the parts of DC machines, Transformers, alternators and Induction machines.
CO5: To get an overview of special electrical machines.

Department of Electronics and Communication Engineering

Course Title : Basic Electronics			
Course Code: P18EC15/25	**Semester : I/II**	**L-T-P-H: 3 – 0 – 0-3**	**Credits:03**
Contact Period : Lecture :42 Hrs, Exam: 3Hrs		**Weightage :CIE:50% SEE:50%**	

Course Content

UNIT-I

Diode Applications: Introduction, Load Line Analysis, Series Diode Configurations, Parallel and Series – Parallel Configurations, Sinusoidal in puts; Half-Wave Rectification, Full wave Rectification, Zener Diodes, **Power Supplies:** Introduction, General Filter Considerations, Capacitor Filters, IR Emitters, Liquid Crystal Displays, Solar Cells. **08 Hrs**

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

Self -Study Component: Voltage Multiplier Circuit, IC Voltage Regulator

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). 09 Hrs 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

Self -Study Component: MOSFET Relay Driver, Fixed Biasing Circuit using DMOSFET and Feedback Biasing Circuit using EMOSFET

UNIT-III

Operational Amplifiers: Introduction, Op-Amp Basics, Practical Op Amp Circuits, Op Amp 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)** .

08 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 **Self - Study Component**: Instrumentation Amplifier, AC and DC Mili-Voltmeter using OP-AMP

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. **08 Hrs**

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

Self - Study Component: Code Converters using Gates, 1Bit and 2Bit comparators using gates

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. **09 Hrs** Text-2: 15.1 - 15.4, 18.1 - 18.22

Self Study Component: Any two practical Applications of Transducers, Satellite launching vehicles GSLV from ISRO (Only Block Diagram and Principle of operation)

TEXT BOOKS:

1)"Electronic Devices and Circuit Theory", Robert L . Boylestad andLouisNashelsky,10th Edition, Prentice Hall , 2009.
2) "Basic Electronics", D P Kothari, I J Nagrath ,M cGraw Hill Education,2014.

REFERENCE BOOKS:

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

c) Course Outcomes (CO)

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

Course Title: Basic Electronics		
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]
CO2	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, MOSFET based amplifier, digital circuit	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: P18MEL16/26	**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**	

Relevance of the course: 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.

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. **Fuel Testing:** Determination of flash and fire point of lubricating oils. **3 hrs**
8. **Study Experiments:** 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 Pu blishing 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	
			Test	Record
CIE	50%	50	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 and Basics of Python programming Laboratory			
Course Code:P18CSL16/26	**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**	

*******Before start the Lab programs, execute these simple programs *******

1. Accept two numbers and perform basic arithmetic operations like +, -, *, / and %
2. Solve equations using mathematic built in functions(sqrt, abs, fabs, pow)
3. To find area/volume of geometric shapes(circle, square, rectangle, triangle).
4. To convert temperature between Fahrenheit and Celsius.
5. Compute simple and compound interest.
6. To print the size of various data types in C.
7. To check if given number is even or odd using conditional statements.
8. To print the numbers from 1 to 10, 10 to 1, 1 to N using for, while and do-while.

List of Lab Programs

1. Write a program that reads the basic pay of an employee and compute the net salary. House rent allowance is 25% of basic pay and the tax rate is as in the table below

Gross Salary	Tax Rate
Gross<=2000	No tax
2000 < Gross <= 4000	3%
4000 < Gross <= 5000	5%
Gross > 5000	8%

   Gross pay is calculated as sum of basic pay and house rent allowance and net salary is the difference of gross with income tax.(use else-if ladder statement)
2. As per the user choice evaluate the expression after reading necessary values using simple if statement
   - A+2 > B || !C && A==D || A-2 <= E
   - A = A>B ? B<<2 : B>>2
   - A - = (--A) + (A--) – (A--)
3. Write a program to find the roots of a quadratic equation using switch statement.
4. Given the 3 digit register number along with marks of 5 subjects for 100 marks of a student, write a program using switch statement 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’
5. Write a program to reverse 6 digit integer number and check whether that number is palindrome or not.
6. Write a program to print ‘N’ Fibonacci numbers a nd find their sum.
7. Write a program to find the value of Sin(x) using the series x – x^3/3! + x^5/5! – x^7/7! Up to ‘N’ terms and also print sin(x) values using libra ry function.
8. Write a program by reading ‘N’ integer numbers a nd perform binary search.
9. Write a program to read ‘N’ names and sort the n ames using bubble sort.
10. Write a program to find the product of two matrixes.
11. Write a program using functions
    i) To read an array of ‘N’ integer data
    ii) Search an key element in an array using linear search (Pass parameters and use local variables)
12 Write a function to find mean, variance and deviation for a set of N elements (type int) in array. (Declare variables globally)
13. Write a program to add two complex numbers using structures.
14. Write a python program
    i) To check whether the given number is positive, negative or zero.

ii) To display all the prime numbers within an interval

15. Write a python program
    i) To make a simple calculator that can add, subtract, multiply and divide any two numbers based on user choice.
    ii) To find the sum of natural numbers up to n where n is provided by user.

Course Outcomes

At the end of the course, student will be able

Design and Implement programs using C language and Python

Department of Physics

Course Title: Engineering Physics Lab			
Course Code: P18PHL17/27	**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 related to engineering applications. The students are able to gain the knowledge about set up and conduct the experiments to get good results with better accuracy. The course provides more experimental skills in understanding the applications of physics used in the experiments pertaining to the field of engineering chosen by the students.

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. **Spring Constant** – Verification of Hooke's law and determination of spring constant.
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 of a capacitor by 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 self inductance and quality factor of a coil by series and parallel resonance method.
14. **Semiconductor** - Determination of energy gap of a given semiconductor by four probe method.

Text Book:

1. Laboratory Manual for Engineering Physics Lab.

Reference Book:

1. **Practical Physics** – Harnam Singh and Dr. P.S. Hemne – S Chand and Co .Ltd.
2. Engineering Physics lab manual – B. N. Subbarao, Su has publication

Course Outcomes (Course Learning Outcomes) (COs)

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

CO1. Develop the skills for setting and conduct the experiments relevant to basic concepts, theories and phenomenon of Physics pertaining to Engineering field.

CO2. Develop the knowledge to take readings in different measuring tools and instruments while conducting the experiments and calculation of errors.

Evaluation Scheme for CIE and SEE.				
I. CIE Scheme: Continuous Internal Evaluation (CIE)				
Scheme	**Weightage**	**Marks allotted**	**Event Break Up**	**Distribution of Marks**
CIE	50%	50	1. Performance of each experiment conducted is evaluated for 20 marks and average is taken for all the experiments.	20
			2. Each experiment in the record is evaluated for 10 marks and average is taken for all the experiments.	10
			3. A test is conducted and evaluated at the end of the semester.	20
Total CIE shall be calculated by adding above three components				**50**
Note : *A student must secure 40% or 20 marks in CIE to eligible for SEE*				

II. SEE Scheme: Semester End Examination (SEE)					
Scheme	**Weightage**	**Marks allotted**	**Event Break Up**	**Distribution of Marks**	
				Part (A+B)	**Total**
SEE	50%	50	1. Experimental write-up work	05 + 05	10
			2. Set-up/Circuit connections, conduction of experiments and taking readings	10 + 10	20
			3. Calculations, Graph and Results	05 + 05	10
			4. Viva-Voce	05 + 05	10
Total SEE shall be calculated by adding above four components:					**50**

Note: *i) **S**emester **E**nd **E**xamination (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
v) A student must secure 40% or 20 marks in SEE to Pass that course

Department of Chemistry

Course Title: Engineering Chemistry lab			
Course Code:P18CHL17/27	**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:

1. Engineering Chemistry lab plays an important role to develop the skill in engineering and medical fields.
2. In this lab the students are well trained to identify the quality and quantity of many engineering materials.
3. The lab is useful for analyses of water pollution.
4. Chemistry lab is also useful to check the purity of metals and alloys which are used as engineering materials.
5. The lab is also useful in the determination of metal ion in the body fluid which plays an important role in identification of diseases.

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. **(Demonstration only)**

Part- B: Instrumental analysis

8 Determination of pKa value of a weak acid using pH meter.
9 Determination of viscosity coefficient of a liquid using Ostwald's Viscometer.
10 Estimation of FAS or Mohr's salt by Potentiometric method.
11 Estimation of acid mixture by Conducto metric method.
12 Estimation of copper by Colorimetric method.
13 Estimation of iron by Colorimetric method.
14 Flame photometric determination of sodium in a fluid. **(Demonstration only)**

Text Books

1. Vogel's A.I. A text book of quantitative analysis, 35th edition, 2017.
2. Willard and others. A text book of Instrumental analysis, 6th edition 2017.

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.

Course Outcomes (Course Learning Outcomes) (COs)

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

CO1 Understand and Conduct the experiments.
CO2 Determine quality and quantity of materials.

Evaluation Scheme for CIE and SEE.

1. Continuous Internal Evaluation (CIE) Scheme:

Scheme	Weightage	Marks allotted	Event Break Up	Distribution of Marks
CIE	50%	50	1. Performance of each experiment conducted will be evaluated for 20 marks and average will be taken for all the experiments.	20
			2. Each experiment which is written in the record will be evaluated for 10 marks and average is taken for all the experiments.	10
			3. A test will be conducted and evaluated at the end of the semester.	20
Total CIE shall be calculated by adding above three components				**50**

Note : *A student must secure 40% or 20 marks in CIE to eligible for SEE*

2. Semester End Examination (SEE) Scheme:

Scheme	Weightage	Marks allotted	Event Break Up	Distribution of Marks	
				Part (A+B)	Total
SEE	50%	50	1. Procedure writing	05 + 05	10
			2. Conduction of experiments and taking values.	12 + 12	24
			3. Calculations, Graph and Results	05 + 05	10
			4. Viva-Voce	03 + 03	06
Total SEE shall be calculated by adding above four components				**25 + 25**	**50**

Note: *i) **S**emester **E**nd **E**xamination (SEE) shall be 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 5 mark will be deducted out of 25 marks only in Part – B
v) A student must secure 40% or 20 marks in SEE to Pass that course

Training and Placement

Course Title: Effective Communication Development. (ECD)			
Course Code :P18HU18	**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 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.**

Self-study component: Basics of verbal. Parts of speech, usage of parts of speech.

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.**

Self-study component: Basic knowledge of the three tenses.

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. Self-study component:** Importance of building vocabulary, Basic words, Usage of simple words at the right Context.

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.**

Self-study component: Basic formation of sentences, usage of punctuations.

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 maximize 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', Understand ing 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.**

Self-study component: Looking within one's self, setting one's goals. Bas ic writing skills. Manners – what to do and what not. Procrastination.

Reference Books

1. "Word Power Made Easy New Revised and Expanded Ed ition", First Edition, Norman Lewis, Goyal Publisher.
2. "Essential English Grammar", Raymond Murphy, Camb ridge University Press, new edition

Course Outcomes

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.
2. Exhibit knowledge of correct pronunciation of words.
3. Exhibit amplified level of confidence to express themselves in English.
4. Reflect elevated standard of learning through the implementation of creative cognitive techniques.
5. Understand the correct usage of Tenses and Articles.

Course Title: Indian Constitution, Human Rights and Professional Ethics			
Course Code: P18HM19/29	**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: P18HM19/29	**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 Ecos ystem, 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 an d 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, Urbaniz ations industrialization. **5 Hrs.**

Unit –V

Acid Rain, Ozone layer depletion, Animal Husbandry. Environmental protection – Role 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 Int ernational Publishers, 2007

Department of Kannada

Course Title : Kannada Kali			
Course Code: P18HM110/210	**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 Ramayana.
Possessive forms of nouns, dubitive question, Relative nouns.

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:P18MA21	**Sem:** II	L-T-P-H: 4-0-0-4	**Credits:** 4
Contact Period: Lecture: 52Hrs**, Exam:** 3 Hrs		**Weightage: CIE:50%; SEE:50%**	

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 , eigen value 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 a system of linear equations: Gauss elimination method. Gauss - Jordan and LU decomposition methods. Eigen values and Eigen vectors of a square matrix. Similarity of matrices and diagonlisation of matrices (For 2×2 real matric es only). Quadratic forms: Reduction to canonical form by orthogonal transformation. **10 Hrs Self study component**- Review of elementary properties of matrices.

Unit – II

Linear Differential equations of second and higher order equations with constant coefficients: Homogeneous/non-homogeneous equations. Inverse Differential operators, $f(D)\,y = R(x)$ where $R(x) = e^{ax}$, $\sin ax$ / $\cos ax$ *and Polynomial in x* Solutions of initial value problems. Method of undetermined coefficients. Method of variation of parameters, Solution of Cauchy's and Legendre's linear differential equations. **10 Hrs**

Self study component-Review of linear $f(D)\,y = R(x)$ where $R(x) = e^{ax}\,V(x)$ *Where* $V(x) = x^n$

Unit – III

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

Unit – IV

Applications of partial differentiation to Jacobians, Taylor's theorem for a function of two variables (without proof), Maxima and Minima for a function of two variables. Illustrative examples with applications. 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 p roof)-Illustrated examples. Orthogonal curvilinear coordinates (OCC). **10 Hrs Self study component**-Errors and approximations Expressions for gradϕ, div $\bar{A}$, curl $\bar{A}$ and Laplacian of ϕ in OCC.

Unit –V

Multiple Integrals – Double and triple integrals-region of integratio n. Evaluation of double integrals by changing of order of integration. Application of multiple integrals: Change of variables and applications to area and volume. Beta and Gamma functions: Definition, relationship between Beta and Gamma function (No derivation)-Simple problems only.

Self study component- Applications of double and triple integrals- Calculation of mass, centre of gravity, centre of pressure and moment of inertia. Duplication formula for beta and gamma functions**.** **10 Hrs**

Text Books:

1. B.S. Grewal: Higher Engineering Mathematics, 43nu Edition- 2015, 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. G.B. Thomas and R.L. Finney. Calculus and analytic geometry. 9th editions, Pearson reprint, 2002. 3."Calculus- Early Transendentals", James Stewart:7 th Edition , Cengage, 2012.

Course Outcomes

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

CO-1. Explain linear system of equations, Eigen values/vectors similarity and diagonalisation of matrices.

CO-2:Solve linear second order differential equations. Evaluate Laplace transformsand inverse Laplace transforms.

CO-3:Evaluate the Jacobeans, and the Taylors series expansion. and find the extreme value. Analys the vector integration to use in the study of line integrals.

CO-4:Evaluate the multiple integrals and Evaluate application oriented problems.

Training and Placement

Course Title: Professional Communication Development. (PCD)			
Course Code : P18HU28	**Semester : 2**	**L - T – P-H: 0 - 2 –0-2**	**Credits:1**
Contact Period: Lecture: 32Hrs, Exam: 3 Hr		**Weightage: CIE:50%; SEE:50%**	

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 **6Hrs Self-study component:** Knowledge about basic words, parts of speech. Building simple sentences.

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, Under- standing 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. **8Hrs Self-study component:** Applications of previously learnt parts of speech into sentences. Identifying the different parts of speech in a sentence.

UNIT-III

Vocabulary builder - Gaining increased momentum

How to talk about actions– Verbs that accurately de scribe 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, en ergy, honesty, mental keenness, bravery, charm, sophistication, etc. **6Hrs Self-study component:** Application of the previous session on vocabulary builder.

UNIT-IV

Writing Skills 2: Format for e-mail writing. Format for Letter Writing. Some common errors. Creative Writing. Blog Writing **4Hrs Self-study component:** Basics of paragraph writing, punctuations.

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 cli- mate of life.

Self-study component: Applications of the basic and intermediate level of vocabulary sessions.

Reference Books

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

2."Essential English Grammar" by Raymond Murphy, publ ished by Cambridge University Press.

Course Outcomes

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

1. Amplified level of confidence to express themselves in English.

2. Elevated standard of learning through the implementation of creative cognitive techniques.

3. Understand the correct usage of Prepositions and Conjunctions.

4. Write Emails, Letters and Creative passages.

5. Apply the knowledge of vocabulary in his speaking and writing

P.E.S. College of Engineering, Mandya

(An Autonomous Institution affiliated to VTU, Belagavi)

3 – Week Induction Programme Modules and Activities

Sl. No.	Modules	Activities
		Initial Phase
1	Induction & Orientation Programmes	• Inauguration of Induction & Orientation day Programmes • Brief Introduction on Institution • Brief introduction on Induction Programme • Visit to the departments by Students • Interaction with the Parents
		Regular Phase
2	Know your department	• Registration in the department • Know your department & Laboratories • Know your faculties & their status • Visit the centre of Excellences of the departments
3	Visiting other departments	• Visit the other departments of the institution • Known other department & Laboratory facilities • Known other department centre of excellence
4	Common Facilities	• Visit & Know about Sports facilities • Visit & know about Library & Information Centre • Visit & Know about Hostel facilities
5	Universal Human Values, Professional Ethics & Proficiency	• Talk on Universal Human Values by Experts • Talk on Professional Ethics by Experts • Talk on Proficiency by Experts
6.	Health related activities	• Lecture on Health & habits • Health checkup by the organization • Organizing a Blood donation camp
7	Social responsible Activities	• Awareness on Swachh Bharat Abhiyan • Awareness on Red Cross & NSS Activities • Awareness on Social Responsibilities & Traffic Rules
8	Interactions with Expert personalities	• Interaction with Industry Peoples • Interaction with Placement & Training Officers • Interactions with Alimonies
9	Physical Activities & Responsibilities	• Improve the health by Physical Activities • Improve the health by Yoga • Improve the health by Regular Exercise
10	Creative Arts & Cultural Programmes, Visit to local area	• Involvement in Creative arts • Involvement in Cultural programmes • Visit to Local Area
11	Innovations & Best Practices	• Create interest in Research & Innovations • Create interest in Project works • Create interest in Best Practices
		Final Phase
12	Valedictory function	• Induction Programme Valedictory function • Interaction between Students & Teacher on Induction Programme • Feed Back From the Students

PHYSICS CYCLE **I – Semester B.E. Time - Table for the Ye ar : 2018 - 19**

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	P18MA11	Engg. Maths-1	6	P18MEL16	Basic Mech.Engg.science-lab
2	P18PH12	Engg. Physics	7	P18PHL17	Physics lab
3	P18CV13	Engg. Mechanics	8	P18HU18	Professional Comm..Development
4	P18ME14	Elements of Mech. Engg.	9	P18HM19	Constitution of India(2hrs)
5	P18EE15	Basic. Elect. Engg.			

Note: Sl No8 – Professinal Communication

Development Classes s will be conducted in Placement Training center and MBA block

CHEMISTRY CYCLE **I - Semester B. E. Time - Table for the Year : 2018 - 19**

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	P18MA11	Engg. Maths	6	P18CSL16	Programming Lab.
2	P18CH12	Engg. Chemistry	7	P18CHL17	Chemistry lab
3	P18CS13	C-Programming	8	P18HU18	Profess. Communication development
4	P18EC15	Basic Electronics	9	P18EV19	Env. Studies
5	P18MED14	CAED.	10	P18HM110	Language (Kan.) (2hrs)

Note: Sl. No. 8 – Professional Communication development Classes will be conducted in Placement Training center and MBA block.

Chairman
(DrB.Shanmukha)
Time-Table Committee

Principal
(Dr.H. V.Ravindra)
PESCE, Mandya

13-08-2018

EVENTS IN ACADEMIC CALENDAR (TENTATIVE) (ODD SEMESTER OF 2018-19) I SEM B.E

Sl. No.	Date	Day	Remarks
1	16-08-2018	Thursday	*Orientation program(Morning Session)*
2	16-08-2018	Thursday	*Course Registration(Afternoon session)*
3	16-8-2018 To 05-09-2018		*Induction program*
4	17-09-2018	Monday	Verification of Course Registration forms by Students/Mentors/HODs.
5	24-09-2018	Monday	Submission of Filled in SEE Application form
6	12-10-2018	Friday	Submission of Assignment-I
7	15-10-2018	Monday	* *Test - I & Quiz – I*
8	16-10-2018	Tuesday	* *Test - I & Quiz – I*
9	17-10-2018	Wednesday	* *Test - I & Quiz – I*
10	23-10-2018	Tuesday	*Last date to withdraw from the course*
11	25-10-2018	Thursday	Submission of Test - I & Quiz - I marks to COE
12	07-11-2018	Wednesday	Regular classes / Submission of Assignment-II
13	15-11-2018	Thursday	* *Test - II & Quiz – II*
14	16-11-2018	Friday	* *Test - II & Quiz – II*
15	17-11-2018	Saturday	* *Test - II & Quiz – II*
16	22-11-2018	Thursday	Posting of Attendance online
17	24-11-2018	Saturday	Submission of Test -II & Quiz - II marks to COE
18	27-11-2018	Tuesday	Makeup Test
19	28-11-2018	Wednesday	Makeup Test
20	29-11-2018	Thursday	Makeup Test
21	01-12-2018	Saturday	Last teaching Day & Posting of CIE online
22	02-12-2018 to 09-12-2018		SEE Practical Exam
23	12-12-2018 to 31-12-2018		SEE Theory Exam

Total number of Odd semester working days=80
06 Days for Test/Quiz =06 days
Total number of Regular Class For first semester (80 - 14)=66/6=11
weeks *4 classes/week/subject=44 classes/subject for
One Extra theory class per subject for six weeks and Two extra lab session is to be planned on two Saturday afternoon sessions