Introduction to Engineering

CO 2: Explain how a student can acquire the competencies
CO 2: Explain how a student can acquire the competencies

LO 2.1 Explain OBE model
   SO 2.1.1 Explain the advantages of OBE
   SO 2.1.2 State PEOs and POs
   SO 2.1.3 Explain the purpose of technical POs
   SO 2.1.4 Explain the purpose of professional POs
   SO 2.1.5 Map the POs to graduate attribute
   SO 2.1.6 Classify the courses in OBE Model
   SO 2.1.7 Explain OBE model
Outcome Based Education

According to Chairman of National Board of Accreditation (NBA)

• Outcome based education is student centered instruction that focuses on measuring student performance i.e. outcomes.

• Outcomes include knowledge, skills and attitudes
  – MCET is leveraging the Autonomous status to implement Outcome Based Education across all programmes
Programme Educational Objectives

• Programme Educational Objectives describe why the programme exists.

• PEO statements have behaviors that have to be demonstrated by alumni of the programme 3-5 years after graduation.
PEOs of B.E. Electrical and Electronics Engineering

PEO1. Technical Expertise: Actively apply technical and professional skills in engineering practices towards the progress of the organization in competitive and dynamic environment

PEO2. Lifelong Learning: Own their professional and personal development by continuous learning and apply the learning at work to create new knowledge

PEO3. Ethical Knowledge: Conduct them selves in a responsible, professional and ethical manner supporting sustainable economic development which enhances the quality of life.
Programme Outcomes (POs) and Programme Specific Outcomes (PSOs)

• POs and PSOs describe the capabilities (knowledge, skill and attitude) of graduates

• PO/PSO statements have behaviors that have to be demonstrated by students of a programme immediately upon graduation

• POs and PSOs have been grouped as technical and professional at MCET
Programme Outcomes (POs) - Regulations 2016

On successful completion of B.E. Electrical and Electronics Engineering programme, graduating students/graduates will be able to:

• **PO1.** Apply the knowledge of Mathematics, Science and Engineering to solve problems in the field of Electrical and Electronics Engineering. *(Technical)*

• **PO2.** Identify, formulate/model, analyse and solve complex problems in the field of Electrical and Electronics Engineering. *(Technical)*

• **PO3.** Design an Electrical/Electronic System/Component, or Process to meet specific purpose with due consideration for economic, environmental, social, political, ethical, health and safety issues. *(Technical)*

• **PO4.** Design and conduct experiment, analyse and interpret data to provide valid conclusions in the field of Electrical and Electronics Engineering. *(Technical)*

• **PO5.** Apply appropriate techniques and modern tools for design and analysis of Electrical/Electronic systems with specified constraints. *(Technical)*

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• **PO6.** Apply contextual knowledge to provide engineering solutions with societal, professional & environmental responsibilities. *(Professional)*

• **PO7.** Provide sustainable solutions within societal and environmental contexts for problems related to Electrical and Electronics Engineering. *(Professional)*

• **PO8.** Comply with code of conduct and professional ethics in engineering practices. *(Professional)*

• **PO9.** Work effectively as an individual or as a member/leader in multi disciplinary team to find solutions for engineering problems. *(Professional)*

• **PO10.** Communicate effectively to engineering community and society with proper aids and documents. *(Professional)*

• **PO11.** Demonstrate knowledge and understanding of the engineering and management principles to manage projects in multidisciplinary environment. *(Professional)*

• **PO12.** Recognise the need for, and have the ability to engage in independent and lifelong learning *(Professional)*
Programme Specific Outcomes (PSOs) - Regulations 2016

• **PSO1:** Design and analyze systems associated with industrial control, power and automotive industries. *(Technical)*

• **PSO2:** Develop products to cater the societal and industrial needs considering recent technological developments in Electrical & Electronics Engineering. *(Professional)*
Purpose of Technical Skills POs

These POs are primarily aimed at
1. developing knowledge and
2. improving skills
in the programme
Purpose of Professional Skills POs

Professional Skills POs are framed and used in the programmes for the following purposes;

1. Normal educational system grossly misses preparing students for holistic living

2. Employers insist development of behavioral skills and attitude at the college/school since they are very difficult to develop at the workplace.

3. Individuals (students) neglect of wellness and hence become a burden to the society at large in later stages of life

4. Individuals (students) lack emotional instability, ability to develop harmonious relations and work in teams, ability to take up challenges and adapt to changes also compromise on moral and ethical issues
Structure of Courses - LTPC

• Courses have lecture (L), tutorials (T), practical (P) hours with credits (C) for each of these.
  
  • Normally one lecture hour is one credit and TWO tutorial or practical hours is one credit

• Courses will also have self – study which will be essential for the complete understanding of the course.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Humanities, Social Sciences including Management Courses</td>
</tr>
<tr>
<td>2</td>
<td>Basic Science Course including Mathematics, Physics, Chemistry, Biology</td>
</tr>
<tr>
<td>3</td>
<td>Engineering Science Courses including Materials, Workshop, Drawing, Basics of Electrical/Electronics/Computer/Mechanical/Instrumentation</td>
</tr>
<tr>
<td>4</td>
<td>Professional Core Courses relevant to the chosen specialization/branch (may be split into hard (no choice) and soft (with choice))</td>
</tr>
<tr>
<td>5</td>
<td>Professional Elective Courses relevant to the chosen specialization/branch</td>
</tr>
<tr>
<td>6</td>
<td>Open Elective Courses from other technical and or emerging subject areas</td>
</tr>
<tr>
<td>7</td>
<td>Project work, Seminar and internship in industry or elsewhere</td>
</tr>
<tr>
<td>8</td>
<td>Mandatory Courses (Environmental Sciences, Induction Training, Indian Constitution, Essence of Indian Traditional Knowledge)</td>
</tr>
</tbody>
</table>

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## Curriculum with category of courses

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course Title</th>
<th>Type</th>
<th>LTPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communication Skills – I</td>
<td>Humanities</td>
<td>2023</td>
</tr>
<tr>
<td>2</td>
<td>Engineering Mathematics – I</td>
<td>Basic Science</td>
<td>3204</td>
</tr>
<tr>
<td>3</td>
<td>Engineering Graphics</td>
<td>Engineering Science</td>
<td>1043</td>
</tr>
<tr>
<td>4</td>
<td>Electric Circuit Analysis</td>
<td>Professional Core</td>
<td>3204</td>
</tr>
<tr>
<td>5</td>
<td>High Voltage Engineering</td>
<td>Professional Elective</td>
<td>3003</td>
</tr>
<tr>
<td>6</td>
<td>Energy Auditing and Conservation</td>
<td>Open Elective</td>
<td>3003</td>
</tr>
<tr>
<td>7</td>
<td>Sports for Wellness</td>
<td>Professional Skills</td>
<td>0021</td>
</tr>
<tr>
<td>8</td>
<td>Application of MATLAB in Electrical Engineering</td>
<td>One Credit</td>
<td>0021</td>
</tr>
</tbody>
</table>

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B.E./B.Tech. Programme Structure

Around 180 Credits

SEM-Semester
OCC-One Credit Courses
TS-Technical Skills Courses
PS- Professional Skills Courses

I SEM TS
II SEM TS
III SEM TS
IV SEM TS
V SEM TS
VI SEM TS
VII SEM TS
VIII SEM TS
Project

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Assessments and Grading

• Assessments always target outcomes
• Formative (without impacting grade) and summative (impacts grades)
• Continuous Comprehensive Evaluation System
  – CCET (Tests), TQA (Tutorial, Quiz, Assignment), ESE (End Semester Examination)
• Absolute Grading
CGPA

• The overall performance of the student is described by **Cumulative Grade Point Average (CGPA)** and is calculated taking into consideration grade obtained by the student in all courses and credits attached to it.

• It is the weighted average of the grade points of all the letter grades obtained in courses by the student from his/her entry into the programme. \( \text{CGPA} \) is computed as follows:
\[
CGPA = \frac{c_1 g_1 + c_2 g_2 + \ldots + c_n g_n}{c_1 + c_2 + \ldots + c_n}
\]

- Where \(c_1, c_2, \ldots, c_g\) denotes credits associated with the course and \(g_1, g_2, \ldots, g_n\) denotes grades obtained by the student.
Read the academic regulations of the institution available in intranet and come prepared for the next session.
THANK YOU
Introduction to Engineering

CO 2: Explain how a student can acquire the competencies
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LO 2.2. Explain the resources and facilities available to acquire specific competencies

2.2.1. List the books, magazines, journals and e-resources available in the campus

2.2.2. List the centers of excellence, value added training centers, Labs, CIBIE, LLC and other IT facilities (EasyEdu, One-App, NPTEL, etc.)

2.2.3. Explain the resources and facilities available to acquire specific competencies
List the books, magazines, journals and e-resources available in the campus

1. Central Library
   - Magazines
   - Books
   - Journals
   - Back Volumes

2. Digital Library
   - e-resources

3. Gandhi Study Center
4. Collection of Question Papers
5. DELNET
6. Document Delivery Services (DDS)
7. Inter Library Loan (ILL)
8. MOOC (NPTEL, SWAYAM, WebX etc.)
Other Resources available in campus

• Laboratories
• Center of excellence
• Value added training
• One credit courses
• CIBIE(Centre for Innovation, Business Incubation and Entrepreneurship)
• LLC
• IT facilities (EasyEdu, MCETOne etc.)
Video 2.1 – Facility and amenities of MCET

On seeing this AV,

• List five Centers of Excellence
• List two Value Added Training and other facilities
• State how LLC will build your communication skills
2.2.3. Explain the resources and facilities available to acquire specific competencies

<table>
<thead>
<tr>
<th>Resource and Facilities</th>
<th>Skills/ Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library</td>
<td>Technical Communication</td>
</tr>
<tr>
<td></td>
<td>Life long learning</td>
</tr>
<tr>
<td>Language Learning Center</td>
<td>Communication</td>
</tr>
<tr>
<td>Clubs</td>
<td>Time management Coordination</td>
</tr>
</tbody>
</table>
Home work – work book

- List **FIVE journals** available in the library relevant to mechanical/electrical and electronics engineering
- List **FIVE websites** relevant to mechanical/electrical and electronics engineering
- List **FIVE NPTEL courses** in mechanical/electrical and electronics engineering
Connect the resources, facilities relevant to competencies in the workbook.
THANK YOU
Introduction to Engineering

CO 2: Explain how a student can acquire the competencies
LO 2.3. Explain the various activities to acquire specific competencies

2.3.1 List the various on campus activities such as curricular (lecture, tutorial, practical and self study), Extra-curricular (NSS, NCC, Sports) and Co-curricular (competitions, professional society activities, guest lectures, etc.)

2.3.2 List the various off campus activities such as conferences, symposiums, industrial visits, internships, education expos, competitions (SUPRA, BAJA, FSS) and publishing technical papers

2.3.3 Explain the various activities to acquire specific competencies
• Graduate Attributes are acquired by
  – Curricular
  – Co-curricular and
  – Extra curricular activities
• Curricular Activities:
  – Lecture
  – Tutorial
  – Practical
  – Self- Study - enhances the capability of lifelong learning
• Co-curricular and Extra Curricular Activities
  – Competitions
  – Professional society activities
  – Guest lectures
  – NSS
  – NCC
  – Sports
  – Etc.
Off campus activities

- Participate in Conferences
- Attend Symposiums
- Visit Industries
- Do Internships
- Attend Education expos
- Participate in Competitions (SUPRA, BAJA, FSS)
- Publish technical papers in Journals
Presenting a project in competition

Communication

Language Learning Center
- Listening
- Speaking
- Reading
- Writing

Youth Parliament

Presenting a seminar

Participating in Association activities

Publishing an article in journal

Mind-map

On campus Resources

Off campus Activities

On campus activities
The vehicle shown was built by students from MCET, for FORMULA STUDENT SPAIN 2014.

1. List at least TEN activities that would have been part of making this happen.
2. Justify how all the 12 graduate attributes, would have been demonstrated by the students and represent the same using a mind-map.
Prepare a list of all the co-curricular and extra curricular activities and study their objectives
Prepare a resume of yourself to be used for recruitment application during the year 2021.
Calculate the CGPA of the following cases and hence comment on the significance of credits in CGPA

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Grades of Mr./Ms. A</th>
<th>Grades of Mr./Ms. B</th>
<th>Grades of Mr./Ms. C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>O</td>
<td>A+</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>A+</td>
<td>A+</td>
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<tr>
<td>7</td>
<td>2</td>
<td>A+</td>
<td>A</td>
<td>A+</td>
</tr>
</tbody>
</table>
You are currently in FIFTH semester, and have a CGPA of 9.00. Comment on the ease of improving CGPA to 9.5 at the end of the current semester. (Assume all required data suitably).
THANK YOU