



**M.Tech Energy Systems Engineering Curriculum structure and Syllabus**

**Curriculum content**

<b>Course Code:</b> 18EESC801	<b>Course Title:</b> Economics and Planning of Energy Conversion	
L-T-P: 4-0-0	Credits: 4	Contact Hrs: 4hr/week
ISA Marks: 50	ESA Marks: 50	Total Marks: 100
Teaching Hrs: 50		Exam Duration: 3 hrs

Case studies on evaluation of Economics and Financial feasibility of Energy conversion devices		
1. Indicators of Financial Performance, Incremental Analysis of Investment Projects Approaches of uncertainty in Financial Analysis ,Social Cost-benefit Analysis of Projects		10hrs
2. Case Studies to assess : Solar Distillation Plant		5hrs
3. Family size Bio-gas plant		5hrs
4. Box type Cooker.		5hrs
5. Improved Bio-mass cook-stove		5hrs
6. Energy Efficient Motors in Industries		5hrs
7. Solar Photovoltaic lanterns		5hrs
8. Power Generation from Rice-Husk		5hrs
9. Wind power gererator		5hrs
<b>Text Books</b>		
1. Khandpal T.C., Garg H.P., Financial Evaluation of Renewable Energy Technologies, Mac-Millan India Ltd., 1 <sup>st</sup> Edn, 2003		
2. Sukhatme S.P., Nayak J.K., Solar Energy: Principles of Thermal Collection and Storage, TMGH, 2008		
<b>Reference Book</b>		
1. Tiwari G.N., Solar Energy: Fundamentals, Design, Modelling and Applications, Alpha Science International Limited, 2015		



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## Course Feedback

(To be filled by each Student at the time of Course Completion)

Dear Students,

Please give us your views on this Course so that the course quality can be improved. You are encouraged to be frank and constructive in your comments.

Course Teacher

Department/School Mechanical Engg Name of the Teacher Dr R.S. Hosamath

Course Title Economics and Planning of Energy Conversion Course code: 18EEEC801 Semester III M.Tech.

a. The design of the course	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
The course objectives were clear		✓			
The course contents met with your expectation	✓				
The course work load was manageable		✓			
The lecture sequence was well planned to meet learning outcomes	✓				
The contents were illustrated with adequate examples		✓			
The course exposed you to new knowledge and practice	✓				
The level of the course was moderate		✓			

b. The conduct of the course	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
The lectures were easy to understand & ideas and concepts presented clearly	✓				
The teaching aids were effectively used		✓			
The course material handed out was adequate	✓				
Were objectives of the course realized?		✓			
The overall environment in the class was conducive to learning	✓				

c. Learning Resources	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
Learning materials (Lesson Plans, Course Notes etc.) were relevant and useful		✓			
Recommended reading Books etc. were relevant and appropriate	✓				
The provision of learning resources in the library was adequate and appropriate	✓				

d. Assessment	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
The method of assessment were reasonable	✓				
Feedback on ISA assessment was timely	✓				
Feedback on ISA assessment was helpful	✓				

Suggestions for improvement:

More number of practice based questions

Overall rating of the course: (✓ tick mark the appropriate)

90% - 100% ☐ 70% - 80% ☒ 50% - 70% ☐ Below 50% ☐

Date: 10/5/2019

Signature 18/05/2019





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The course contents met with your expectation		✓			
The course work load was manageable	✓				
The lecture sequence was well planned to meet learning outcomes		✓			
The contents were illustrated with adequate examples	✓				
The course exposed you to new knowledge and practice	✓				
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Learning materials (Lesson Plans, Course Notes etc.) were relevant and useful		✓			
Recommended reading Books etc. were relevant and appropriate		✓			
The provision of learning resources in the library was adequate and appropriate	✓				

d. Assessment	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
The method of assessment were reasonable	✓				
Feedback on ISA assessment was timely		✓			
Feedback on ISA assessment was helpful	✓				

Suggestions for improvement:

practice based questions

Overall rating of the course: (✓ tick mark the appropriate)

90% - 100% ☐ 90% - 80% ☒ 80% - 70% ☐ 70% - 50% ☐ Below 50% ☐

Date: 10/5/2019

  
Signature



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## Course Feedback

(To be filled by each Student at the time of Course Completion)

Dear Students,

Please give us your views on this Course so that the course quality can be improved. You are encouraged to be frank and constructive in your comments.

Course Teacher

Department/School Mechanical Engg Name of the Teacher Dr. R.S. Hosangath

Course Title Economics and Planning of Energy Conversion Course code: 18EEEC501 Semester III Mech [M.Tech]

a. The design of the course	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
The course objectives were clear		✓			
The course contents met with your expectation		✓			
The course work load was manageable	✓				
The lecture sequence was well planned to meet learning outcomes		✓			
The contents were illustrated with adequate examples	✓				
The course exposed you to new knowledge and practice	✓				
The level of the course was moderate		✓			

b. The conduct of the course	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
The lectures were easy to understand & ideas and concepts presented clearly	✓				
The teaching aids were effectively used		✓			
The course material handed out was adequate	✓				
Were objectives of the course realized?		✓			
The overall environment in the class was conducive to learning	✓				

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Learning materials (Lesson Plans, Course Notes etc.) were relevant and useful		✓			
Recommended reading Books etc. were relevant and appropriate		✓			
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The method of assessment were reasonable	✓				
Feedback on ISA assessment was timely		✓			
Feedback on ISA assessment was helpful	✓				

Suggestions for improvement:

More practical orientation

Overall rating of the course: (✓ tick mark the appropriate)

90% -100% ☐ 90%70% - 80% ☒ 6 - 70%50% - ☐ Below 50% ☐

Date: 10/5/2019

Signature





Dear Sir,

We seek your kind participation in this process of collecting feedback about our graduates serving in your organization. Your inputs will be helping us to make required modifications in the existing curriculum, pedagogy to enhance the competencies of the graduating engineers. For each question, indicate your opinion with a tick mark(✓) in the appropriate column. All individual responses will be kept confidential. Only statistically analyzed results from the entire population will be shared.

Regards,

Head, School of Mechanical Engineering

S.No	Competencies	Level of Competency			
		Completely Dissatisfied	Dissatisfied	Satisfied	Completely Satisfied
1	<b><u>Research skills :</u></b>				
	An ability to independently carry out research /investigation and development work to solve practical problems.				✓
2	<b><u>Communication:</u></b>				
	Publish scholastic thought process through Thesis/ Technical article.				✓
3	<b><u>Scholarship of Knowledge:</u></b>				
	Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.			✓	
4	<b><u>Use of Modern tool:</u></b>				
	Ability to use modern computational tools in modeling, simulation and analysis of Energy Engineering related problems with an understanding of				✓
5	<b><u>Sustainable Designs :</u></b>				
	An ability to select and integrate products and processes that account for long-term consumer satisfaction and environmental conservation.			✓	





Indicate your Answer with symbol "✓" in the appropriate box.

1) How would you rate your overall satisfaction with your preparation to become an engineer?

Not Satisfied ☐ Little Satisfied ☐ Satisfied ☐ Very Satisfied ☒

2) In general, the department has provided a good quality academic program?

Poor ☐ OK ☐ Good ☒ Very Good ☐

Name: SHRINIVAS PUNDALIK PATIL	Branch: ESE
e-mail id: Shrinipp@gmail.com Mobile:	Batch: 2016-18
Name of the company: High Systems Electromechanical Works LLC Dubai, UAE	
Correspondence Address: Dubai UAE.	
Signature:	



Dear proud alumni,

The following are the list of skills and competencies that engineering graduates should have. We seek your participation in the Alumni Survey conducted to know your satisfaction with the *level of competency* you have achieved as a result of your education at the Institution and also able to practice the same. For each question, indicate your opinion with a tick mark(✓) in the appropriate column. All individual responses will be kept confidential. Only statistically analyzed results from the entire population will be shared.

Regards,

Head, School of Mechanical Engineering

S.No	Competencies	Level of Competency			
		Completely Dissatisfied	Dissatisfied	Satisfied	Completely Satisfied
1	<b><u>Research skills :</u></b>				
	Review Design Engineering literature to gain insight into problem analysis, design/development of solutions and research gaps.			✓	
	Develop a solution using appropriate technique to address the identified problem.				✓
2	<b><u>Communication:</u></b>				
	Publish scholastic thought process through Thesis/ Technical article.			✓	
	Articulate research findings emphasizing its real time utility to stakeholders.				✓
3	<b><u>Scholarship of knowledge:</u></b>				
	Develop alternate or new concepts to a problem through innovative application of domain knowledge.				✓
	Apply principles of Design Engineering for complete investigations into operation, monitoring and control of a process, system or device.				✓
4	<b><u>Use of Modern tools:</u></b>				
	Acquire competence in modern design computational tools for modeling, simulation and analysis of machine component or system.				✓
5	<b><u>Sustainable designs:</u></b>				
	Apply sustainability principles to evolve benign solutions that ensure highest standards in public health, safety, justice and cultural diversities.				✓





Indicate your Answer with symbol "✓" in the appropriate box.

1) How would you rate your overall satisfaction with your preparation to become an engineer?

Not Satisfied ☐ Little Satisfied ☐ Satisfied ☐ Very Satisfied ☒

2) In general, the department has provided a good quality academic program?

Poor ☐ OK ☐ Good ☒ Very Good ☐

Name: <u>Dhivya shree MR</u>	Branch: <u>ESE</u>
e-mail id: <u>dhivyashreemr@gmail.com</u> Mobile: <u>+91 529052 954</u>	Batch: <u>2016-18</u>
Name of the company: <u>Eco facility Management Services, Ras Al Khaimah, UAE</u>	
Correspondence Address: <u>Dhivyashree MR,</u> <u>MEP Engineer</u> <u>Shop floor A4, Al Rafan Road</u> <u>Ras Al Khaimah, UAE</u>	
Signature: <u>Dhivya</u>	





Dear Sir,

We seek your kind participation in this process of collecting feedback about our graduates serving in your organization. Your inputs will be helping us to make required modifications in the existing curriculum, pedagogy to enhance the competencies of the graduating engineers. For each question, indicate your opinion with a tick mark(✓) in the appropriate column. All individual responses will be kept confidential. Only statistically analyzed results from the entire population will be shared.

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2	<b><u>Communication:</u></b>				
	Publish scholastic thought process through Thesis/ Technical article.			✓	
3	<b><u>Scholarship of Knowledge:</u></b>				
	Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.				✓
4	<b><u>Use of Modern tool:</u></b>				
	Ability to use modern computational tools in modeling, simulation and analysis of Energy Engineering related problems with an understanding of				✓
5	<b><u>Sustainable Designs :</u></b>				
	An ability to select and integrate products and processes that account for long-term consumer satisfaction and environmental conservation.				✓



Space for comments:

- Practice Oriented training in Economic aspects related to Industrial Equipments
- Scope for promoting renewable energy forms to augument for the good power.

Name of the organization: Hindalco India Ltd.

Address: Industry house 2nd floor  
# 45, Race Course Road  
Bangalore 560001

Name of the contact person: K. Suresh

Designation: Senior H.R. Manager

e-mail id: k.suresh@gmail.com Mobile: 91-80-40416118

Signature:





Dear Sir,

We seek your kind participation in this process of collecting feedback about our graduates serving in your organization. Your inputs will be helping us to make required modifications in the existing curriculum, pedagogy to enhance the competencies of the graduating engineers. For each question, indicate your opinion with a tick mark(✓) in the appropriate column. All individual responses will be kept confidential. Only statistically analyzed results from the entire population will be shared.

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2	<b><u>Communication:</u></b>				
	Publish scholastic thought process through Thesis/ Technical article.			✓	
3	<b><u>Scholarship of Knowledge:</u></b>				
	Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.			✓	
4	<b><u>Use of Modern tool:</u></b>				
	Ability to use modern computational tools in modeling, simulation and analysis of Energy Engineering related problems with an understanding of			✓	
5	<b><u>Sustainable Designs :</u></b>				
	An ability to select and integrate products and processes that account for long-term consumer satisfaction and environmental conservation.				✓



Space for comments:

- ✓ The orientation to conduct energy assessment of renewable energy conversion devices from the point of efficiency enhancement
- ✓ Knowledge on costing and financial assessment of Industrial equipment

Name of the organization: ARMAX AUTOMATION Pvt Ltd

Address: CHETAN CIRCLE, No. 51-54  
2<sup>nd</sup> Cross, Vinayaka Layout  
BENGALURU 560091

Name of the contact person: Er. KumarSwami R

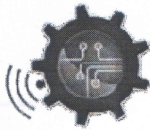
Designation: Senior H.R. Manager

e-mail id: info@armaxindia.com

Mobile: 9148341999

Signature:





### Curriculum Revision

Course: Economics and Planning of Energy Conversion Code: 18EEESC801 Course: Economics and Planning of Energy Conversion

Course Instructor: R.S.Hosmath Pass %: 100% Code: 17EEESC707

2018-19		Inputs	2019-20
Program Outcomes Mapping	Attainment		Program Outcomes Mapping
PO2-2	2.8	Faculty Experiences (Course feedbacks/Student interactions/others): thorough background to financial decisions in implementation of renewable energy proposals. Case study based approach is best suited to impart practical knowhow.	PO2-2 PO3-2
PO3-2	3.0	Industry Advises/inputs: To provide exposure to real-life situations that involves financial planning during project execution.	
		Placement Feedback: strengthen fundamentals of economic decision making in implementation of renewable energy and their associated challenges.	
		Other inputs ( <i>specify</i> ): To impart practice based learning methodology that gives deeper insight into basic design concepts	
Innovations/Changes:			BOS approved
a. CO added	NIL		<input type="checkbox"/>
b. PO added	NIL		<input type="checkbox"/>
c. Content/topic added/refined	The content modified to accommodate change in L-T-P credit structure from 4-0-0 to 3-1-0 laying emphasis on case study based investigation.		<input checked="" type="checkbox"/>
d. Change in Delivery mode	More emphasis on learning through practice based approach.		<input checked="" type="checkbox"/>
e. Change in Assessment type	The revised evaluation to include ISA 1 and ISA 2 for 30 marks along with 20 marks Term paper/ seminar		<input checked="" type="checkbox"/>
f. Any other, specify	NIL		<input type="checkbox"/>

Faculty Signature



13-04-2019

### **Minutes of the BOS Meeting in School of Mechanical Engineering**

The meeting of the BOS in Mechanical Engineering was held on 13<sup>th</sup> April 2019 at 10.00am in the Office of the School Head, Mechanical Engineering, KLE Technological University, Hubballi.

The meeting began with the Chairman welcoming members of the BOS and other invited faculty and student members. The following agenda points were taken up for discussion.

#### **Agenda 1:**

Review of actions initiated in the last meeting.

#### **Resolution 1:**

The actions initiated in the previous BOS held on 7<sup>th</sup> April 2018 were reviewed and minutes of the last meeting were confirmed.

The action taken report presented to the board was approved by the members.

The Chairman informed the members about the Industry Advisory Board meeting held on 23<sup>rd</sup> March 2019 and presented the salient features which would be considered during the meeting.

#### **Agenda 2:**

Review of Syllabus of UG program

#### **Resolution 2:**

The School Head presented the curriculum changes for UG program.

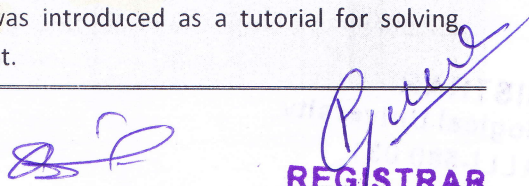
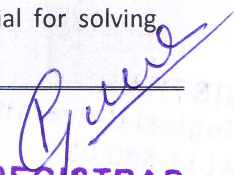
Board reviewed and appreciated the Program syllabi for its flexibility with respect to student learning and enhancing employability prospects. The Mechatronics and Control Engineering courses were suggested revisions in terms of re-allotment in number of teaching hours and suitable pedagogical interventions in delivery.

The study on sensor - 1st order/2nd order/steady/transient response to be investigated in detail while electronic concepts related to interface design may be restricted to introductory level. Electro-mechanical actuators can be given more emphasis, selection of AC/DC drives, Pneumatics can be part of Control/ Mechatronics study.

Revisions were also suggested in the course on 'Finite Element Methods'. Revisions to the existing curriculum were focused on post processing techniques in software tools and data acquisition for experimental validation. To cover the case studies pertaining to industrial field issues, numerous examples were included in the curriculum. The associated lab introduced with complex engineering challenges as exercises. Further, the students were expected to publish papers on their laboratory work.

The course CAD Modelling and PLM (2-0-2) introduced with 15hr/week hands-on immersive training experience, with a focus on Exposure to system building from components/sub-systems. Emphasis on 2D, 3D drafting, generation of BOM, GD&T, exploded view and rendering features was increased. Also, included Product development and Reverse Engineering as an extension to create industry-like learning environment through virtual Projects (Mini Project).

The experts from Mathematics suggested modifications in 'Numerical Methods and Partial Differential Equation' course: Python programming was introduced as a tutorial for solving engineering problems to help students get better insight.

  
  
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The courses Machine Drawing and Manufacturing Processes II were introduced in place of Engineering Design & Product Realization which was to become the theme of Minor Project. The members approved the change.

The courses *Advanced Statistics and Machine Learning* and *Machine Learning Applications* introduced as niche verticals in view of job prospects in engineering services sector was highly appreciated and approved for implementation.

The verticals on E-Mobility elective were introduced after consultations with experts from Altair - *Vehicle Structure and Design Optimization* and *Dynamics & Durability of Vehicles*. The external members both from academia and industry were in alignment in approving the courses for implementation as the field is upcoming both for entrepreneurship potential and employability.

Another elective course on Applications of Vibrations and acoustics was introduced after extensive interaction with M/s Josts – a leading company in the field of NVH. The BOS approved the course for implementation.

The Industry internship/project during 8th sem to ensure a longer duration Industrial contact for students leading to their employability was approved for implementation.

The scheme and curriculum from 1st sem to 8th sem for respective admission batches was approved.

### Agenda 3:

Review of Syllabus of PG program

### Resolution 3:

The Machine Design/Production Management/Energy Systems Engineering M.Tech. Programs were provisioned longer industry stay for students with entire 3<sup>rd</sup> sem for Industrial training/project got BOS approval.

The course **Computational Methods in Engineering Analysis** for MD /ESE Programmes was approved with suggestions to have concepts of statistics, probability and random events.

In Machine Design Programme, Thermal stress module has been introduced in **Mechanics of solids** course to focus on thermo elastic stress–strain relations of thin circular disk, long circular cylinder, and straight beams.

The Energy Systems Engineering Programme proposed a new course titled **Economic aspects of Energy conversion** to cover economic aspects of energy conversion. The changes were approved with suggestion to give due stress on analytical aspects.

The Production Management Programme proposed a course on **Research Methodology** with orientation towards research practice covering research techniques and statistical tools. The change has been appreciated and approved by BoS members.

To enhance employment opportunities to graduating students a thorough hands-on experience on PLM/ERP tools is essential, therefore Mini Project course was introduced at the 2<sup>nd</sup> semester. The practice oriented initiative was duly appreciated and approved.

The curriculum scheme and structure from 1<sup>st</sup> sem to 4<sup>th</sup> sem for respective admission batches was approved.

### Agenda 4:

New initiatives

### Resolution 4:

The initiatives to help student learn and acquire niche skill sets in *Product Lifecycle Management (PLM)* (6 credit, 2 elective, 160 hr), *Advanced CAE* (6 credit, 2 elective, 160 hrs) and minor program





– *Advanced Manufacturing for Aerospace Applications* (15 credit, 5 course, 320 hrs + Project at AEQU campus), were three verticals that resulted in 45 student placements. (Recruitment orders expected by last week of May 2019).

Employment Initiatives for Production Management PG program through revamped curriculum with focus on PLM and ERP to facilitate student employability in Engineering Services Industry.

The School is working on other potential verticals for UG program in *Machine Learning*, *E-mobility* and *Digital Twin*, the detailed syllabi will be shared with BOS members through email for approval.

The collaborative efforts being made by the School with the Dassault Systems, Altair, Bosch and AEQU in designing the niche verticals was appreciated by the members.

The new initiatives and the efforts by the faculty members were encouraged.

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#### Agenda 5:

Status of Minor Programs

#### Resolution 5:

The status of all four minor programs - *Innovation and Product Development*, *Automotive Engineering*, *Bio-Engineering* and *Advanced Manufacturing for Aerospace Applications* was presented.

The status of Minor Programs was reviewed and endorsed by the BOS.

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#### Agenda 6:

Student Performance

#### Resolution 6:

The student achievements in curricular, co-curricular and extra-curricular activities were presented. The experiential and contextualized learning opportunities created by the School in various courses helped students perform consistently in their regular academics and acquire the relevant technical and professional skills. Students' engagement in research was visible through their active participation in REU course leading to many publications, one of which has won 1<sup>st</sup> prize in an international conference. A team of students has won prestigious All India National Meritorious Invention Award for their product 'Smart FOB' under the category 'National Budding Innovators' organized by NRDC and Ministry of Science & Technology, successively second time with a prize money of Rs. 1,00,000/-. The Motor Sports club participated in SAE India E-BAJA, M-BAJA and SUPRA competitions and won no. of awards. A team of aeroKLE – an aero modelling club participated first time in National level SAE India Aero Design Challenge 2018 competition and got All India 8<sup>th</sup> Rank.

The overall student performance in UG and PG Programmes were discussed and approved.

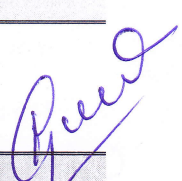
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#### Agenda 7:

Review of Research progress

#### Resolution 7:

The on-going research activities in the School, publication and citation details and patents filed by the faculty were discussed. The initiative at KLETU Research Centre to promote an inclusive

  
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research through SRG, ERG and ERS group was presented with special focus on REU and REEF courses.

The members reviewed and approved the proposed initiatives with suggestion to actively continue research.

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**Agenda 8:**

Review of OBE framework of the School

**Resolution 8:**

The OBE initiatives and attainment of Program Outcomes along with Program Specific Program outcomes were closely reviewed and appreciated.

The PEOs and POs were also reviewed for their relevance and approved for continuation.

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**Agenda 9:**

Initiative for attainment of key results

**Resolution 9:**

The School initiatives in alignment with University guidelines to enhance operational efficiency were presented.

The four objectives and the key results (OKRs) were approved with due appreciation to the efforts made.

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**Agenda 10:**

Any other matter with the permission of the chair

**Resolution 10:**

The changing placement scenario for mechanical engineering students was discussed in the backdrop of IT companies not hiring non-IT graduates from the current year. The expectation of niche skill sets by core companies has prompted the school to identify industry relevant verticals to get the students employed. In the process a dilemma in curriculum design arises that should imbibe niche skill sets without compromise on fundamental concepts. The members cited similar experiences and suggested incremental mode of growth was relevant in present context as practiced by the school. At no point of time, emphasis on fundamental core courses should be diluted, the members opined.

The board empowered the chairman to revise/modify curriculum structure and syllabus wherever required, if circumstances so demand and the same could be ratified in the next meeting.

The meeting was concluded with vote of thanks by the Chairman.

Enclosed:

1. UG Program – Structure and Syllabus

- i. 2016 - 2020 batch
- ii. 2017 - 2021 batch
- iii. 2018 - 2022 batch
- iv. 2019 - 2023 batch

  
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## 2. PG Program – Structure and Syllabus

- i. Production Management
  - a. 2018 – 2020 batch
  - b. 2019 – 2021 batch
- ii. Energy Systems Engineering
  - a. 2018 – 2020 batch
  - b. 2019 – 2021 batch
- iii. Machine Design
  - a. 2018 – 2020 batch
  - b. 2019 – 2021 batch








## 3. Minor Program


- i. Innovation and Product Development
- ii. Automotive Engineering
- iii. Bio-engineering
- iv. Advanced Manufacturing for Aerospace Applications

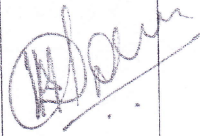
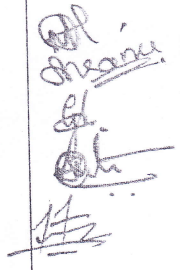

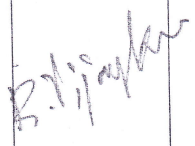
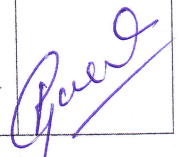
  
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## Members of BOS in Mechanical Engineering

S.No.	Name	Profession	Full Postal Address	Position	Signature
1.	B B Kotturshettar	Professor & Head of the School/ Department	Professor & Head, Mechanical Engineering	Chairman	
2.	N R Banapurmath	Professor, Dean's nominee	Professor, Mechanical Engineering	Member	
3.	S B Burli	Associate Professor Dean's nominee	Associate Professor, Mechanical Engineering	Member	
4.	P M Bhovi	Assistant Professor Dean's nominee	Assistant Professor, Mechanical Engineering	Member	
5.	Dr. Nagesha N.	Subject expert from outside the college nominated by the Vice-Chancellor	Professor, Department of studies in Industrial and Production Engineering, University B D T College of Engineering, Davangere	Member	
6.	Dr. S V Prabhu	Subject expert from outside the college nominated by the Vice-Chancellor	Professor Department of Mechanical Engineering, Indian Institute of Technology, Bombay. Professor, Indian Institute of Technology, Dharwad	Member	 13/4/19
7.	<del>Veeresh Vastrad</del> Bashant Marikatti	Representative from industry corporate sector/ allied area relating to placement nominated by the Vice-Chancellor	Principal Engineer Quest Global, Belgaum	Member	 13/04/19
8.	Dr. Prasanna G Bhat	Representative from industry corporate sector/ allied area relating to placement nominated by the Vice-Chancellor	General Manager, Powertrain Engineering, The Automotive Research Association of India, S.No. 102, Vetali Hills, Off Paud, Kothrud, Pune	Member	 13/04/19

  
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S.No.	Name	Profession	Full Postal Address	Position	Signature
9.	S B Menon	Post-graduate meritorious alumnus nominated by the Vice-Chancellor	CEO Unique Circle Group, Pimpri Chinchwad, Pune	Member	
10.	<i>Student Representatives</i>	Student Member representing each of the program offered by the Department/ School/ Center	<i>Program Details</i>	Student Member	
	Manjunath Hlremath		UG		
	Shravya M.Sanu		UG		
	Girish Karikatti		PG-MD		
	Ashwini Hlremath		PG_ESE		
	Faraz Mueen Mulla		PG-PM		
	Sushruth Halewadimath		Ph.D		
11.	P P Revankar	ONE Senior faculty member nominated by the concerned Head of the Department/ School/ Center	Associate Professor, PG-Energy Engineering	Member Secretary	
12.	Dr. Murigendrappa	Invitee	Associate Professor, National Institute of Technology Karnataka, Surathkal	Member	
13.	Dr. Anand Ramani	Invitee	Subject Matter Expert and Head of CAE KPIT Technologies Ltd., Bangalore F-016 Gopalan Habitat Splendour Brooke fields, Kundalahalli	Memembr	
14.	Vijaykumar R	Invitee	General Manager, Mechanical Engineering Robert Bosch Engineering and Business Solutions Pvt. Ltd., Campus 1B,Ecospace, Bangalore	Member	
15.	Prof. S. Gopalakrishnan	Invitee	Assistant Professor Dept. of Mechanical Engineering Indian Institute of Technology Bombay	Member	





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S.No.	Name	Profession	Full Postal Address	Position	Signature
16.	K G Kodancha,	Invitee	Professor, PG-Machine Design	Member	
17.	V N Gaitonde	Invitee	Professor, PG-Production Management	Member	
18.	V N Sanagoudar	Invitee	Associate Professor, Mechanical Engineering	Member	

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## M.Tech. Energy Systems Engineering Curriculum Structure & Syllabus

### Curriculum Content

Course Code:19EESC707	Course Title: Economics and Planning of Energy Conversion	
L-T-P: 3-1-0	Credits: 4	Contact Hrs: 5 hr/week
ISA Marks: 50	ESA Marks: 50	Total Marks: 100
Teaching Hrs: 40		Exam Duration: 3 hrs

Case studies on evaluation of Economics and Financial feasibility of Energy conversion devices	
1. Indicators of Financial Performance, Incremental Analysis of Investment Projects Approaches of uncertainty in Financial Analysis ,Social Cost-benefit Analysis of Projects	8 hrs
2. Case Studies to assess : Solar Distillation Plant	4 hrs
3. Family size Bio-gas plant	4 hrs
4. Box type Cooker.	4 hrs
5. Improved Bio-mass cook-stove	4 hrs
6. Energy Efficient Motors in Industries	4 hrs
7. Solar Photovoltaic lanterns	4 hrs
8. Power Generation from Rice-Husk	4 hrs
9. Wind power generator	4 hrs
Text Books	
1. Khandpal T.C., Garg H.P., Financial Evaluation of Renewable Energy Technologies, Mac-Millan India Ltd., 1 <sup>st</sup> Edn, 2003	
2. Sukhatme S.P., Nayak J.K., Solar Energy: Principles of Thermal Collection and Storage, TMGH, 2008	
Reference Book	
1. Tiwari G.N., Solar Energy: Fundamentals, Design, Modelling and Applications, Alpha Science International Limited, 2015	