ELECTRICAL AND ELECTRONICS ENGINEERING DEPARTMENT

EES – EEE

2017 regulation

Semester: 3

Theory:

Course Code	Course Title	C	L	T/SLr	P/R	Ty / Lb/ ETL
BMA17006	Mathematics III For Electrical Engineers	4	3	1/0	0/0	Ty
BEE17001	DC Machines and Transformers	4	3	1/0	0/0	Ty
BEE17002	Circuit Theory and Network Synthesis	4	3	1/0	0/0	Ty
BEE17003	Electrical and Electronics Measurements	3	3	0/0	0/0	Ty
BME17I03	Thermodynamics and Fluid Mechanics	3	3	0/0	0/0	Ty

Practical:

BEE17ET1	Advancement in Electronics *	3	1	0/2	1/1	ETL
BEE17L01	DC Machines and Transformer Laboratory	1	0	0/0	3/0	Lb
BEE17L02	Electric Circuits Laboratory	1	0	0/0	3/0	Lb
BME17IL2	Fluid Mechanics and IC Engine Laboratory	1	0	0/0	3/0	Lb

Credits Sub Total: 24

Semester: 4

Theory:

Course Code	Course Title	C	L	T/SLr	P/R	Ty / Lb/ ETL
BMA17011	Numerical Methods for Electrical Engineers	4	3	1/0	0/0	Ty
BEE17004	AC and Special Machines	4	3	1/0	0/0	Ty
BEE17005	Electromagnetic Field Theory	4	3	1/0	0/1	Ty
BEE17006	Power System Protection and Switchgear	3	3	0/0	0/0	Ty
BEC17I07	Communication Systems and IOT	3	3	0/0	0/0	Ty

Practical:

BSK17ET1	Soft Skill 1	2	1	0/1	1/0	ETL
BEE17ET2	Linear and Digital Integrated Circuits*	3	1	0/2	1/1	ETL

BEE17L03	Power System Protection and Switchgear Laboratory	1	0	0/0	3/0	Lb
BEE17L04	AC and Special Machines Laboratory	1	0	0/0	3/0	Lb
BEC17IL6	Digital Design Laboratory	1	0	0/0	3/0	Lb
BEE17TS1	Technical Skill 1 (Evaluation)	1	0	0/0	2/0	Lb

Credits Sub Total: 27

Semester: 5

Theory:

Course Code	Course Title	C	L	T/SLr	P/R	Ty / Lb/ ETL
BEE17007	Transmission and Distribution System	4	3	1/0	0/0	Ty
BEE17008	Control Systems	4	3	1/0	0/0	Ty
BEE17009	Power Electronics and FACTS Controllers	3	3	0/0	0/0	Ty
BEE17010	Microprocessor, Microcontroller and ARM Processor	3	3	0/0	0/0	Ty
BEC17I08	Fundamentals of Digital Signal Processing	3	3	0/0	0/0	Ty

Practical:

BEE17ET3	Design of Electrical Machines *	3	1	0/2	1/1	ETL
BEE17L05	Microprocessor, Microcontroller and ARM Processor Laboratory	1	0	0/0	3/0	Lb
BEE17L06	Control and Instrumentation Laboratory	1	0	0/0	3/0	Lb
BEC17IL5	Signal Processing and Communication Laboratory	1	0	0/0	3/0	Lb
BEE17TS2	Technical Skill 2 (Evaluation)	1	0	0/0	2/0	Lb
BEE17L07	Inplant Training (Evaluation)	1	0	0/0	2/0	Lb

Credits Sub Total: 25

Semester: 6

Theory:

Course Code	Course Title	C	L	T/SLr	P/R	Ty / Lb/ ETL
BEE17011	Power System Analysis	4	3	1/0	0/0	Ty
BEE17012	Electric Transients and High Voltage Engineering	3	3	0/0	0/0	Ty
BEE17EXX	Elective 1	3	3	0/0	0/0	Ty

BEI17I02	Industrial Drives and Automation	3	3	0/0	0/0	Ty
BEE17OE1	Open Elective (Interdisciplinary)	3	3	0/0	0/0	Ty

Practical:

BSK17ET2	Soft Skill 2	2	1	0/1	1/0	ETL
BEE17L08	Energy Utilization and Conservation Laboratory	1	0	0/0	3/0	Lb
BEE17L09	Power Electronics and Drives Laboratory	1	0	0/0	3/0	Lb
BEE17L10	Power System Simulation Laboratory	1	0	0/0	3/0	Lb
BEE17L11	Mini Project (Evaluation)	1	0	0/0	0/2	Lb
BEE17TS3	Technical Skill 3 (Evaluation)	1	0	0/1	0/1	Lb

Credits Sub Total: 23

Semester: 7
Theory:

Course Code	Course Title	C	L	T/SLr	P/R	Ty / Lb/ ETL
BEE17013	Microgrid Technology	4	3	0/0	0/1	Ty
BEE17014	Power System Operation , Control & Power Quality	4	3	1/0	0/0	Ty
BEE17EXX	Elective 2	3	3	0/0	0/0	Ty
BEE17EXX	Elective 3	3	3	0/0	0/0	Ty
BMG17002	Management Concepts and Organization Behaviour	3	3	0/0	0/0	Ty

Practical:

BEE17ESX	Elective (Special - Based On Current Technology) *	3	1	0/2	1/1	ETL
BEE17L12	Industrial Automation Laboratory	1	0	0/1	1/1	Lb
BEE17L13	Microgrid Laboratory	1	0	0/0	2/1	Lb
BEE17L14	Project Phase – 1	2	0	0/1	0/1	Lb
BFL17001	Foreign Language (Evaluation)	2	1	0/1	0/0	Ty

Credits Sub Total: 26

Semester: 8
Theory:

Course Code	Course Title	C	L	T/S Lr	P/R	Ty / Lb/ ETL
BEE17EXX	Elective 4	3	3	0/0	0/0	Ty
BEE17EXX	Elective 5	3	3	0/0	0/0	Ty
BMG17005	Entrepreneurship Development	3	3	0/0	0/0	Ty

Practical*:*

BEE17L15	Project (Phase – II)	10	0	0/0	10	

Credits Sub Total: 19

Credit Summary

Semester : 1 : 18
Semester : 2 : 23
Semester : 3 : 24
Semester : 4 : 27
Semester : 5 : 25
Semester : 6 : 23
Semester : 7 : 26
Semester : 8 : 19

Total Credits : 185

Elective-1

Course Code	Course Title	C	L	T/S Lr	P/R	Ty / Lb/ ETL
BEE17E01	Solar Energy Conversion Systems	3	3	0/0	0/0	Ty
BEE17E02	Advanced Digital Signal Processing	3	3	0/0	0/0	Ty
BEE17E03	Grid Modernization	3	3	0/0	0/0	Ty

Elective-2

Course Code	Course Title	C	L	T/S Lr	P/R	Ty / Lb/ ETL
BEE17E04	Wind Energy Conversion Systems	3	3	0/0	0/0	Ty
BEE17E05	Artificial Intelligence	3	3	0/0	0/0	Ty
BEE17E06	Substation Designing	3	3	0/0	0/0	Ty

Elective-3						
Course Code	**Course Title**	**C**	**L**	**T/S Lr**	**P/R**	**Ty / Lb/ ETL**
BEE17E07	Restructuring of Distribution System	3	3	0/0	0/0	Ty
BEE17E08	Material Science in Aviation	3	3	0/0	0/0	Ty
BEE17E09	Electrical Safety for Engineers	3	3	0/0	0/0	Ty

Elective-4						
Course Code	**Course Title**	**C**	**L**	**T/S Lr**	**P/R**	**Ty / Lb/ ETL**
BEE17E10	IOT Applied to Electrical Engineering	3	3	0/0	0/0	Ty
BEE17E11	Robotics and Automation	3	3	0/0	0/0	Ty
BEE17E12	Green Building Technology	3	3	0/0	0/0	Ty

Elective-5						
Course Code	**Course Title**	**C**	**L**	**T/S Lr**	**P/R**	**Ty / Lb/ ETL**
BEE17E13	Electrical Storage Technology	3	3	0/0	0/0	Ty
BEE17E14	Wide Area ,Monitoring Protection and Control	3	3	0/0	0/0	Ty
BEE17E15	Power Plant Instrumentation	3	3	0/0	0/0	Ty

Subject Code: BSK17ET1	Subject Name :SOFT SKILLS – I CAREER & CONFIDENCE BUILDING	T / L/ ETL	L	T / S.Lr	P/ R	C
	Prerequisite: None	ETL	1	0/1	1/0	2

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE :

- To create awareness in students, various top companies helping them improve their skill set matrix, leading to develop a positive frame of mind.
- To help students be aware of various techniques of candidate recruitment and help them prepare CV's and resume.
- To help student how to face various types of interview, preparing for HR, technical interviews.
- To help students improve their verbal reading, narration and presentation skills by performs various mock sessions.

COURSE OUTCOMES (COs) : (3- 5)

Students will be able to

CO1	Be aware of various top companies leading to improvement in skills amongst them.
CO2	Be aware of various candidate recruitment techniques like group discussion, interviews and be able to prepare CV's and resumes.
CO3	Prepare for different types of interviews and be prepared for HR and technical interviews.
CO4	Improve their verbal, written and other skills by performing mock sessions.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	L	L	L	L	M	M	H	M	H	M	H
CO2	L	L	L	L	L	M	M	H	M	H	M	H
CO3	L	L	L	L	L	M	M	H	M	H	M	H
CO4	L	L	L	L	L	M	M	H	M	H	M	H

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5			
CO1	L	L	H	L	L			
CO2	L	L	H	L	L			
CO3	L	L	H	L	L			
CO4	L	L	H	L	L			

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
			✓						✓			
Approval												

SOFT SKILLS I

UNIT I **6 Hrs**

Creation of awareness of top companies / improving skill set matrix / Development of positive frame of mind / Creation of self-awareness

UNIT II **6 Hrs**

Group discussions / Do's and don'ts – handling group discussions / what evaluators look for interpersonal relationships / Preparation of Curriculum Vitae / Resume

UNIT III **6 Hrs**

Interview – awareness of facing questions – Do's and don'ts of personal interview / group interview, enabling students to prepare for different proce3dures such as HR interviews and Technical Interviews / self-introductions

UNIT IV **6 Hrs**

Verbal aptitude, Reading comprehension / narration / presentation / Mock Interviews

UNIT V **6 Hrs**

Practical session on Group Discussion and written tests on vocabulary and reading comprehension

Total Number of Hours: 30 Hrs

Subject Code: BEE17TSX	Subject Name : TECHNICAL SKILL 1	T / L/ ETL	L	T / S.Lr	P/ R	C
		0	0	0	1	1

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE : The objective is to develop the technical skill of the students.

COURSE OUTCOMES (COs) : (3- 5)

CO1	Develop the technical skills required in the field of study
CO2	Bridge the gap between the skill requirements of the employer or industry and the competency of the students.
CO3	Enhance the employability of the students.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	H	H	H	M	M	H	M	H	M
CO2	H	H	M	H	H	H	M	M	H	H	H	H
CO3	H	H	H	H	H	H	M	M	H	H	H	H

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5			
CO1	H	H	H	H	H			
CO2	H	H	H	H	H			
CO3	H	H	H	H	H			

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
								✓				

Approval	

Subject Code: BEETS17X	Subject Name : TECHNICAL SKILL 2	T / L/ ETL	L	T / S.Lr	P/ R	C
		0	0	0	1	1

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE : The objective is to develop the technical skill of the students.

COURSE OUTCOMES (COs) : (3- 5)

CO1	Develop the technical skills required in the field of study
CO2	Bridge the gap between the skill requirements of the employer or industry and the competency of the students.
CO3	Enhance the employability of the students.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	H	H	H	M	M	H	M	H	M
CO2	H	H	M	H	H	H	M	M	H	H	H	H
CO3	H	H	H	H	H	H	M	M	H	H	H	H

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5			
CO1	H	H	H	H	H			
CO2	H	H	H	H	H			
CO3	H	H	H	H	H			

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
								✓				

Approval	

Subject Code: BEE17L07	Subject Name : INPLANT TRAINING	T / L/ ETL	L	T / S.Lr	P/ R	C
		0	0	0	1	1

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits

T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE : The main objective of the Inplant training is to provide a short-term work experience in an Industry/ Company/ Organization

COURSE OUTCOMES (COs) : (3- 5)

CO1	To get an insight of an industry / organization/company pertaining to the domain of study.
CO2	To acquire skills and knowledge for a smooth transition into the career.
CO3	To gain field experience and get linked with the professional network.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	L	L	L	L	H	H	H	H	H	H	H
CO2	H	M	H	H	M	H	H	H	H	H	H	M
CO3	H	H	H	H	M	H	H	H	H	H	H	M

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5			
CO1	H	H	H	H	H			
CO2	H	H	H	H	H			
CO3	H	H	H	H	H			

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
								✓				
Approval												

Subject Code:	Subject Name : SOFT SKILLS – II	T / L/ ETL	L	T / S.Lr	P/ R	C
	Prerequisite: Soft Skills - I	ETL	1	0/1	1/0	2

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits

T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE : The main objective is to strengthen the logical and arithmetic reasoning skills of the students.

COURSE OUTCOMES (Cos) : (3- 5)

CO1	Recognize and apply arithmetic knowledge in a variety of contexts.
CO2	Ability to identify and critically evaluate philosophical arguments and defend them from criticism.
CO3	Define data and interpret information from graphs.

Mapping of Course Outcomes with Program Outcomes (Pos)

Cos/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	H	H	H	L	L	H	M	H	H
CO2	M	M	M	H	L	H	L	H	H	H	H	L
CO3	H	H	H	H	H	H	M	M	H	H	H	H

Cos / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5			
CO1	M	M	M	M	M			
CO2	M	M	M	M	M			
CO3	M	M	M	M	M			

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
									✓			

Approval	

SOFT SKILLS II

UNIT I Logical Reasoning I **6 Hrs**

Logical Statements – Arguments – Assumptions – Courses of Action

UNIT II Logical Reasoning II **6 Hrs**

Logical conclusions – Deriving conclusions from passages – Theme detection

UNIT III Arithmetical Reasoning I **6 Hrs**

Number system – H.C.F & L.C.M – Problem on ages – Percentage – Profit & Loss – Ratio & Proportion – Partnership

UNIT IV Arithmetical Reasoning II **6 Hrs**

Time & Work – Time & Distance – Clocks – Permutations & Combinations – Heights & Distances – Odd man out and Series

UNIT V Data Interpretation **6 Hrs**

Tabulation – Bar graphs – Pie graphs – Line graphs

Reference Books:

1. R.S.Agarwal, A modern approach to Logical Reasoning, S.Chand & Co., (2017)
2. R.S.Agarwal, A modern approach to Verbal and Non verbal Reasoning, S.Chand & Co., (2017)
3. R.S.Agarwal, Quantitative Aptitude for Competitive Examinations, S.Chand & Co., (2017)
4. A.K.Gupta, Logical and Analytical Reasoning, Ramesh Publishing House, (2014)
5. B.S.Sijwali, Indu sijwali, A new approach to Reasoning (Verbal and Non verbal), Arihant Publishers (2014).

Total Number of hours: 30Hrs

Subject Code: BEE17L11	Subject Name : MINI PROJECT	T / L/ ETL	L	T / S.Lr	P/ R	C
	Prerequisite: NIL	L	0	0/0	0/2	1

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits

T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE :

- To acquire hands-on experience in converting a novel idea / technique into a working model / prototype involving multi-disciplinary skills and / or knowledge and working in at team.

COURSE OUTCOMES (COs) : (3- 5)

CO1	To conceptualize a novel idea / technique into a product
CO2	To develop a multi-disciplinary thinking and enable teamwork
CO3	Ideate and develop a prototype

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	M	M	H	H	H	M	L	H	M
CO2	H	H	H	M	H	M	M	M	H	H	H	H
CO3	H	H	H	H	H	H	M	H	H	M	H	H

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5			
CO1	H	H	H	H	H			
CO2	H	H	H	H	H			
CO3	H	H	H	H	H			

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
							✓					

Approval	

Subject Code: BEE17I14	Subject Name : PROJECT PHASE - 1	T / L/ ETL	L	T / S.Lr	P/ R	C
	Prerequisite: NIL	L	2	0/1	0/1	2

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits

T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE : The objective of the Main Project is to culminate the academic study and provide an opportunity to explore a problem or issue , address through focused and applied research under the direction of a faculty mentor. The project demonstrates the student's ability to synthesize and apply the knowledge and skills acquired to real-world issues and problems. This project affirms the students to think critically and creatively, find an optimal solution, make ethical decisions and to present effectively.

COURSE OUTCOMES (COs) : (3- 5)

CO1	Apply the knowledge and skills acquired in the course of study addressing a specific problem or issue.
CO2	To encourage students to think critically and creatively about societal issues and develop user friendly and reachable solutions
CO3	To refine research skills and demonstrate their proficiency in communication skills.
CO4	To take on the challenges of teamwork, prepare a presentation and demonstrate the innate talents.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	H	M	H	H	L	M	M	H	H
CO2	H	H	H	H	H	H	H	M	M	M	H	H
CO3	H	H	H	H	H	H	H	M	M	H	H	M
CO4	H	M	H	H	H	H	M	H	H	H	H	H

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5			
CO1	H	H	H	H	H			
CO2	H	H	H	H	H			
CO3	H	H	H	H	H			

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
							✓					
Approval												

Subject Code: BEE17L15	Subject Name : PROJECT PHASE - 2	T / L/ ETL	L	T / S.Lr	P/ R	C
	Prerequisite: NIL	L	0	0/0	0/0	10

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits

T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE : The objective of the Main Project is to culminate the academic study and provide an opportunity to explore a problem or issue , address through focused and applied research under the direction of a faculty mentor. The project demonstrates the student's ability to synthesize and apply the knowledge and skills acquired to real-world issues and problems. This project affirms the students to think critically and creatively, find an optimal solution, make ethical decisions and to present effectively.

COURSE OUTCOMES (COs) : (3- 5)

CO1	Apply the knowledge and skills acquired in the course of study addressing a specific problem or issue.
CO2	To encourage students to think critically and creatively about societal issues and develop user friendly and reachable solutions
CO3	To refine research skills and demonstrate their proficiency in communication skills.
CO4	To take on the challenges of teamwork, prepare a presentation and demonstrate the innate talents.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	H	H	H	H	H	H	H	H	H	H	H
CO3	H	H	H	H	H	H	H	H	H	H	H	H
CO4	H	H	H	H	H	H	H	H	H	H	H	H

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5			
CO1	H	H	H	H	H			
CO2	H	H	H	H	H			
CO3	H	H	H	H	H			
CO4	H	H	H	H	H			

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
							✓					

Approval	

Subject Code : BMG17OE8	Subject Name : **TECHNICAL ENTREPRENEURSHIP**	C	L	T/SLr	P/R
		3	**2**	**0/1**	**2/0**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory / Lab / Embedded Theory and Lab

OBJECTIVES :
At the end of the course the learner will be able to

- **Identify their flow & run interview to understand customers views.**
- **Do market analysis & create solutions for the identified problems**
- **Differentiate start up and small business & Understand the basics of lean approach**
- **Study the expectations of customers and investors, and interpret the revenue streams**
- **Articulate an effective pitch and understands how to manage risks.**

COURSE OUTCOMES (Cos) : (3 – 5)
Students completing the course were able to

CO1	**Identify Business Opportunity, Understand Problems & Provide solutions & carry out Design Thinking Process.**
CO2	**Differentiate Customer & Consumer and prepare Value proportion canvas, types of Business models**
CO3	**Interpret Industrial needs, carry out competitive analysis & perform product market fit test**
CO4	**Analyze primary & secondary revenue streams & opt for different pricing strategies**
C05	**Compose positioning statement for the product & build digital presence, planning & budgeting**

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						**M**			**M**			**M**
CO2	**H**	**H**	**H**	**H**	**H**	**H**	**M**		**H**	**M**	**H**	
CO3	**H**	**H**	**H**	**M**	**M**	**M**				**M**	**L**	
CO4	**M**		**M**		**M**	**L**		**H**		**H**		
CO5	**H**	**H**	**H**	**H**	**H**	**M**			**M**	**M**		

H/M/L indicates strength of correlation H – High, M – Medium, L – Low

Category	Basic Sciences	Engg Sciences	Humanities & Social Sciences	Program core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skills	Soft Skills
						√			

Approval	

BMG17OE8 **TECHNICAL ENTREPRENEURSHIP** **3 2 0/1 2/0**

Unit –I DISCOVER YOURSELF & IDENTIFY PROBLEMS WORTH SOLVING (9)

Effectuation – Find your flow – Entrepreneurial style – How to identify Business opportunity - find problems worth solving – Methods of finding & understanding problems - How to run problem interview to understand customer's world view – Design thinking – Process & examples – Idea Generation (DISRUPT) – GOOTB

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Unit –II CUSTOMER SEGMENT, VALUE PROPORTION & LEAN CANVAS (9)

Difference between consumer and customer – Market types – Segmentation & Targeting – Defining the personas – understanding early adopters & customer adoption pattern – early innovators for startups – creative solutions for identified problems – Deep dive into gains, pains & jobs to be done (value proportion canvas) – identify UVP using VPC – outcome driven innovation (I min customer pitch) – Basics of Lean approach & Canvas – Types of business models.

Unit –III SIZING THE OPPURTUNITY & MVP (9)

Introduction to risks –Documents & assumptions – Build solution – Does the solution solve customer problems – Problem – solution test – Difference between a start up venture & small business – industry analysis – competition analysis – Blue ocean strategy – building MVP (document & validation of assumptions – lean feedback loop & MVP/Javelin board – MVP interviews – product market fit test

Unit –IV REVENUE STREAMS (9)

Basics of how companies make money – income, cost, gross and net margin – primary and secondary revenue streams – value, price & costs – different pricing strategies – product costs & unit costs – basics of unit costs – finance for business ideas – various sources of funds & its pros and cons – investor expectations – pitching to investors & corporates – shared leadership – role of good team venture's success – roles & responsibilities – pitch a candidate to join a start up – collaboration tools and techniques

Unit – V MARKETING & SALES (9)

Difference between product brand & link between them – positioning statement for the product – building digital presence and leveraging social media – creating company profile page – measure effectiveness of selected channels – budgeting and planning – sales planning – targets – USP – art of sales pitch - follow up and closing sale – importance of project management – work flow – delegation of tasks – basics of business regulations of starting and operating business – compliance and proper documentation.

PRACTICAL COMPONENT: CAPSTONE PROJECT PRESENTATION & EVALUATION

Total : 45 periods

Subject Code : BMG17OE9	Subject Name :**ADVANCED PROGRAM IN ENTREPRENEURSHIP**	L	T/S Lr	P/R	C
	Prerequisite : BMG17OE8	1	0/1	2/0	3

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory / Lab / Embedded Theory and Lab

OBJECTIVES :

- **Revisit and evaluate the business model & reposition the scalability.**
- **Understand traction, identify & measure the effectiveness of selected channels**
- **Stabilize the revenue streams & explore new channels**
- **Understand the need to build team beyond founder**
- **Identify technology needs and keep proper documentation.**

COURSE OUTCOMES (Cos) : (3 – 5)
Students completing the course were able to

CO1	**Identify additional customer segment & relook problem statement and additional ways to monetize**
CO2	**Measure traction, identify various channels and measure its effectiveness.**
CO3	**Set targets, articulate sales pitch & build a professional team**
CO4	**Test price elasticity, analyze competitors and perform financial modeling of venture growth**
C05	**Use technology as a competitive tool & apply for patents and understand Intellectual Property rights.**

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	**H**	**H**	**M**	**M**	**M**		**H**		**H**	**H**		**L**
CO2			**H**	**M**			**M**				**H**	
CO3				**H**		**M**					**H**	
CO4			**H**	**M**	**M**	**M**	**M**	**M**	**H**			**L**
CO5	**H**		**H**	**M**	**H**	**M**		**L**		**H**		**M**

H/M/L indicates strength of correlation H – High, M – Medium, L – Low

Category	Basic Sciences	Engg Sciences	Humanities & Social Sciences	Program core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skills	Soft Skills
						√			

BMG17OE9	ADVANCED PROGRAM IN ENTREPRENEURSHIP	1	0/1	2/0	3

UNIT I GROWTH, EXPANSION & SCALING 9Hrs

Growth stage and start up phase – revisiting business model and develop few variants – additional customer segments – evaluation of business models for new customer segments – relook of problem statement and repositioning for scalability – additional ways to monetize.

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UNIT II SCALING & STRATEGY 9Hrs

Gain traction beyond early customer – defining and measuring traction – cost of new customer acquisition

– customer life time value – identify wastes and what's important for traction – bullseye framework – identifying channels – measurement of effectiveness of selected channels

UNIT III SALES PLANNING 9Hrs

Budgeting & Planning – stabilizing key revenue streams – additional revenue streams – exploring new channels and partnerships – sales planning and setting targets – unique sales proportion – art of sales pitch – building a professional team – sales compensation and incentives

UNIT IV FINANCIAL MODELLING 9Hrs

testing price elasticity – optimizing cost and operational expenses – advanced concepts in unit costing – financial modeling of venture growth – analyzing competitor and peer's financial models – various sources of funding – investors and lenders expectations - pitch practice – Building teams beyond founders – basics of compensation, incentives and stock options

UNIT V TECHNOLOGY PLANNING 9Hrs

Identify technology needs – cost of using technology to build and grow the business – Technology as a differentiator and competitive weapon – overview of legal issues – importance of getting professional help – importance of being compliant and keeping proper documentation – patents and intellectual property - trademarks

PRACTICAL COMPONENT : CAPSTONE PROJECT – PITCH YOUR VENTURE

Total : 45 periods

Curriculum – 2018 Regulation

I SEMESTER							
S.NO.	**SUBJECT CODE**	**SUBJECT NAME**	**C**	**L**	**T/ SLr**	**P/R**	**Ty/ Lb/ ETL**
1	BEN18001	Technical English - I	2	1	0/0	2/0	Ty
2	BMA18001	Mathematics - I	4	3	1/0	0/0	Ty
3	BPH18001	Engineering Physics - I	3	2	0/1	0/0	Ty
4	BCH18001	Engineering Chemistry - I	3	2	0/1	0/0	Ty
5	BES18001	Basic Electrical and Electronics Engineering	3	2	0/1	0/0	Ty
6	BES18002	Basic Mechanical and Civil Engineering	3	2	0/1	0/0	Ty
PRACTICALS*							
1	BES18L01	Basic Engineering Workshop	1	0	0/0	2/0	Lb
2	BES18ET1	Orientation to Entrepreneurship and Project Lab	1	0	0/0	2/0	ETL

Credits Sub Total: 20

II SEMESTER							
S.NO.	**SUBJECT CODE**	**SUBJECT NAME**	**C**	**L**	**T/ SLr**	**P/R**	**Ty/ Lb/ ETL**
1	BMA18003	Mathematics – II	4	3	1/0	0/0	Ty
2	BPH18002	Engineering Physics –II	3	2	0/1	0/0	Ty
3	BCH18002	Engineering Chemistry – II	3	2	0/1	0/0	Ty
4	BES18003	Environmental Science*	NON CREDIT COURSE				Ty
PRACTICALS*							
1	BEN18ET1	Communication Lab	1	1	0/0	2/0	ETL
2	BES18ET2	Basic Engineering Graphics	2	1	0/0	2/0	ETL
3	BES18L02	Integrated Physical Science Lab	1	0	0/0	2/0	Lb
4	BES18ET3	C Programming and Lab	2	1	0/0	2/0	ETL

Credits Sub Total: 16

TOTAL CREDITS: 36

C: Credits L: Lecture T: Tutorial S.Lr: Supervised Learning P: Problem / Practical R: Research
Ty/Lb/ETL: Theory /Lab/Embedded Theory and Lab * Internal Evaluation

III SEMESTER							
S.NO.	**SUBJECT CODE**	**SUBJECT NAME**	**C**	**L**	**T/ SLr**	**P/R**	**Ty/ Lb/ ETL**
1	BEE18001	Circuit Theory and Network Analysis	4	3	1/0	0/0	Ty

2	BEE18002	DC Machines and Transformers	4	3	1/0	0/0	Ty
3	BEE18003	Electromagnetic Field Theory	3	3	0/0	0/0	Ty
4	BEE18004	Electrical and Electronics Measurements	3	3	0/0	0/0	Ty
5	BME18I03	Thermodynamics and Fluid Mechanics	3	3	0/0	0/0	Ty
PRACTICALS*							
1	BEE18L01	Electrical Machines - I Lab	1	0	0/0	3/0	Lb
2	BEE18L02	Electrical Circuits Lab	1	0	0/0	3/0	Lb
3	BME18IL2	Fluid Mechanics and IC Engine Lab	1	0	0/0	3/0	Lb

Credits Sub Total: 20

IV SEMESTER							
S.NO.	**SUBJECT CODE**	**SUBJECT NAME**	**C**	**L**	**T/ SLr**	**P/R**	**Ty/ Lb/ ETL**
1	BMA18011	Numerical Methods for Electrical Engineers	4	3	1/0	0/0	Ty
2	BEE18005	AC and Special Machines	4	3	1/0	0/0	Ty
3	BEE18006	Power System - I	3	3	0/0	0/0	Ty
4	BEC18I07	Communication Systems and IOT	3	3	0/0	0/0	Ty
5	BHS18NC1/ BHS18NC2	The Indian Constitution*/ The Indian Traditional Knowledge*	NC	2	0/0	0/0	Ty
PRACTICALS*							
1	BEE18ET1	Linear and Digital Integrated Circuits	3	1	0/1	3/0	ETL
2	BEE18L03	Electrical Machines –II Lab	1	0	0/0	3/0	Lb
3	BEE18L04	Measurement and Instrumentation Lab	1	0	0/0	3/0	Lb
4	BEC18IL5	Signal Processing and Communication Lab	1	0	0/0	3/0	Lb
5	BEE18TS1	Technical Skill 1 (Computer Software Packages)	1	0	0/0	3/0	Lb
6	BEN18SK1	Soft Skill I (Career and Confidence Building)	1	0	0/0	3/0	ETL

Credits Sub Total: 22

C: Credits L: Lecture T: Tutorial S.Lr: Supervised Learning P: Problem / Practical R: Research
Ty/Lb/ETL: Theory /Lab/Embedded Theory and Lab * Internal Evaluation

V SEMESTER							
S.NO.	**SUBJECT CODE**	**SUBJECT NAME**	**C**	**L**	**T/ SLr**	**P/R**	**Ty/ Lb/ ETL**
1	BEE18007	Power System - II	4	3	1/0	0/0	Ty
2	BEE18008	Control System	3	3	0/0	0/0	Ty
3	BXX18EXX	Elective 1	3	3	0/0	0/0	Ty
4	BXX18OEX	Open Elective 1	3	3	0/0	0/0	Ty
PRACTICALS*							
1	BEE18ET2	Design of Electrical Machines	3	1	0/1	3/0	ETL

2	BEE18L05	Electronics Lab	1	0	0/0	3/0	Lb
3	BEE18L06	Control System Lab	1	0	0/0	3/0	Lb
4	BEI18IL1	Microprocessor, Microcontroller and ARM Processor Lab	1	0	0/0	3/0	Lb
5	BEE18TS2	Technical Skill 2 (Electrical Software Packages)	1	0	0/0	3/0	Lb

Credits Sub Total: 20

VI SEMESTER							
S.NO.	**SUBJECT CODE**	**SUBJECT NAME**	**C**	**L**	**T/ SLr**	**P/R**	**Ty/ Lb/ ETL**
1	BEE18009	Power System - III	4	3	1/0	0/0	Ty
2	BEE18010	Power Electronics - I	4	3	1/0	0/0	Ty
3	BXX18EXX	Elective II	3	3	0/0	0/0	Ty
4	BXX18OEX	Open Elective 2	3	3	0/0	0/0	Ty
PRACTICALS*							
1	BEE18ET3	Energy Utilization and Conservation	3	1	0/1	3/0	ETL
2	BEE18L07	Electrical Practice Lab	1	0	0/0	3/0	Lb
3	BEE18L08	Power System Lab	1	0	0/0	3/0	Lb
4	BEN18SK2	Soft Skill II (Qualitative and Quantitative Skills)	1	0	0/0	3/0	ETL
5	BEE18L09	Mini Project/Inplant Training/Industrial training	1	0	0/0	3/0	Lb
6	BEE18TS3	Technical Skill 3 (Evaluation of Design and Implementation Practice)	1	0	0/0	3/0	Lb

Credits Sub Total: 22

C: Credits L: Lecture T: Tutorial S. Lr : Supervised Learning P : Problem / Practical R : Research
Ty/Lb/ETL: Theory/Lab/Embedded Theory and Lab *Internal evaluation

VII SEMESTER							
S.NO.	**SUBJECT CODE**	**SUBJECT NAME**	**C**	**L**	**T/ SLr**	**P/R**	**Ty/ Lb/ ETL**
1	BEE18011	Microgrid Technology	4	3	1/0	0/0	Ty
2	BXX18EXX	Elective III	3	3	0/0	0/0	Ty
3	BXX18EXX	Elective IV	3	3	0/0	0/0	Ty
4	BMG18002	Management Concepts and Organizational Behavior	3	3	0/0	0/0	Ty
PRACTICALS*							
1	BEE18ET4	Industrial Drives and Automation	3	1	0/1	3/0	ETL
2	BEE18L10	Microgrid Lab	1	0	0/0	3/0	Lb
3	BEE18L11	Power Electronics and Drives Lab	1	0	0/0	3/0	Lb

4	BEE18L12	Project Phase – I	2	0	0/0	3/3	Lb
5	BHS18FLX	Foreign Language	1	0	0/0	3/0	TY
6	BXX18OLX	Open Lab	1	0	0/0	3/0	Lb

Credits Sub Total: 22

VIII SEMESTER							
S.NO.	**SUBJECT CODE**	**SUBJECT NAME**	**C**	**L**	**T/ SLr**	**P/R**	**Ty/ Lb/ ETL**
1	BEE18012	Power Electronics - II	4	3	1/0	0/0	Ty
2	BEE18013	Smart Grid Technology	3	3	0/0	0/0	Ty
3	BXX18EXX	Elective V	3	3	0/0	0/0	Ty
PRACTICALS*							
1	BEE18L13	Project Phase – II	8	0	0/0	12/12	L

Credits Sub Total: 18

Subject Code: BEE18TS1	Subject Name: TECHNICAL SKILL 1 (Computer Software Packages)	T /L/ ETL	L	T / S.Lr	P / R	C
	Prerequisite: -	**ETL**	**0**	**0/0**	**3/0**	**1**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE:

- The objective is to develop the technical skill of the students

COURSE OUTCOMES (Cos): (3-5)

CO1	Develop the technical skills required in the field of study
CO2	Bridge the gap between the skill requirements of the employer or industry and the competency of the students.
CO3	Enhance the employability of the students.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	H	H	H	M	M	H	M	H	M
CO2	H	H	M	H	H	H	M	M	H	H	H	H
CO3	H	H	H	H	H	H	M	M	H	H	H	H

Cos / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	H	H	H	H	H		
CO2	H	H	H	H	H		
CO3	H	H	H	H	H		
CO4	H	H	H	H	H		

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
								√				

Subject Code: BEN18SK1	Subject Name: SOFT SKILL - I (Career & Confidence Building)	T /L/ ETL	L	T / S.Lr	P / R	C
	Prerequisite: -	**ETL**	**0**	**0/0**	**3/0**	**1**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE:

- To create awareness in students, various top companies helping them improve their skill set matrix, leading to develop a positive frame of mind.
- To help students be aware of various techniques of candidate recruitment and help them prepare CV's and resume.
- To help student how to face various types of interview, preparing for HR, technical interviews.
- To help students improve their verbal reading, narration and presentation skills by performs various mock sessions.

COURSE OUTCOMES (Cos): (3-5)

CO1	Be aware of various top companies leading to improvement in skills amongst them.
CO2	Be aware of various candidate recruitment techniques like group discussion, interviews and be able to prepare CV's and resumes.
CO3	Prepare for different types of interviews and be prepared for HR and technical interviews.
	Improve their verbal, written and other skills by performing mock sessions.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**L**	**L**	**L**	**L**	**L**	**M**	**M**	**H**	**M**	**H**	**M**	**H**
CO2	**L**	**L**	**L**	**L**	**L**	**M**	**M**	**H**	**M**	**H**	**M**	**H**
CO3	**L**	**L**	**L**	**L**	**L**	**M**	**M**	**H**	**M**	**H**	**M**	**H**
CO4	**L**	**L**	**L**	**L**	**L**	**M**	**M**	**H**	**M**	**H**	**M**	**H**

Cos / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	**L**	**L**	**H**	**L**	**L**		
CO2	**L**	**L**	**H**	**L**	**L**		
CO3	**L**	**L**	**H**	**L**	**L**		
CO4	**L**	**L**	**H**	**L**	**L**		

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
			√									

BEN18SK1 SOFT SKILL - I (Career and Confidence Building) 0 0/0 3/0 1

UNIT I

6

Creation of awareness of top companies / improving skill set matrix / Development of positive frame of mind / Creation of self-awareness.

UNIT II

6

Group discussions / Do's and don'ts – handling group discussions / what evaluators look for interpersonal relationships / Preparation of Curriculum Vitae / Resume.

UNIT III

6

Interview – awareness of facing questions – Do's and don'ts of personal interview / group interview, enabling students to prepare for different proce3dures such as HR interviews and Technical Interviews / self-introductions.

UNIT IV

6

Verbal aptitude, Reading comprehension / narration / presentation / Mock Interviews.

UNIT V

6

Practical session on Group Discussion and written tests on vocabulary and reading comprehension

Practical component P : Include case studies / application scenarios

Research component R : Future trends / research areas / Comparative Analysis

Total No. of Periods : 30

Subject Code: BEE18TS2	Subject Name: TECHNICAL SKILL 2 (Electrical Software Packages)	T /L/ ETL	L	T / S.Lr	P / R	C
	Prerequisite:	**L**	**0**	**0/0**	**3/0**	**1**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE:
The objective is to develop the technical skill of the students.

COURSE OUTCOMES (Cos): (3-5)

CO1	Develop the technical skills required in the field of study
CO2	Bridge the gap between the skill requirements of the employer or industry and the competency of the students.
CO3	Enhance the employability of the students.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	H	H	H	M	M	H	M	H	M
CO2	H	H	M	H	H	H	M	M	H	H	H	H
CO3	H	H	H	H	H	H	M	M	H	H	H	H

Cos / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	H	H	H	H	H		
CO2	H	H	H	H	H		
CO3	H	H	H	H	H		

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
							√					

Subject Code: BEN18SK2	Subject Name: SOFT SKILL –II (Qualitative and Quantitative Skills)	T /L/ ETL	L	T / S.Lr	P / R	C
	Prerequisite: BSK18ET1	**ETL**	**0**	**0/0**	**3/0**	**1**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE:

- To help students to improve their Logical reasoning.
- To help students to improve their arithmetic reasoning.
- To help students improve their data interpretation skills

COURSE OUTCOMES (Cos): (3-5)

CO1	Prepare students for Logical reasoning
CO2	Prepare students for arithmetic reasoning
CO3	Prepare students for data interpretation skills

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	L	L	L	L	M	M	H	M	H	M	H
CO2	L	L	L	L	L	M	M	H	M	H	M	H
CO3	L	L	L	L	L	M	M	H	M	H	M	H

Cos / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	L	L	H	L	L		
CO2	L	L	H	L	L		
CO3	L	L	H	L	L		

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
			√									

BEN18SK2 SOFT SKILL –II (Qualitative and Quantitative Skills) 0 0/0 3/0 1

UNIT I LOGICAL REASONING I

6

Logical Statements – Arguments – Assumptions – Courses of Action.

UNIT II LOGICAL REASONING II

6

Logical conclusions – Deriving conclusions from passages – Theme detection.

UNIT III ARITHMETICAL REASONING I

6

Number system – H.C.F & L.C.M – Problem on ages – Percentage – Profit & Loss – Ratio & Proportion – Partnership.

UNIT IV ARITHMETICAL REASONING II

6

Time & Work – Time & Distance – Clocks – Permutations & Combinations – Heights & Distances – Odd man out and Series.

UNIT V DATA INTERPRETATION

6

Tabulation – Bar graphs – Pie graphs – Line graphs.

Total No. of Periods : 30

REFERENCE BOOKS:

1. R.S.Agarwal, A modern approach to Logical Reasoning, S.Chand & Co., (2017).
2. R.S.Agarwal, A modern approach to Verbal and Non verbal Reasoning, S.Chand & Co., (2017).
3. R.S.Agarwal, Quantitative Aptitude for Competitive Examinations, S.Chand & Co., (2017).
4. A.K.Gupta, Logical and Analytical Reasoning, Ramesh Publishing House, (2014).
5. B.S.Sijwali, Indu sijwali, A new approach to Reasoning (Verbal and Non verbal), Arihant Publishers, (2014).

Subject Code: BEE18L09	Subject Name: MINI PROJECT/ INPLANT TRAINING/ INDUSTRIAL TRAINING	T /L/ ETL	L	T / S.Lr	P / R	C
	Prerequisite: --	**L**	**0**	**0/0**	**3/0**	**1**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE:

- The main objective of the Inplant training is to provide a short-term work experience in an Industry/ Company/ Organization

COURSE OUTCOMES (Cos): (3-5)

CO1	To get an insight of an industry / organization/company pertaining to the domain of study.
CO2	To acquire skills and knowledge for a smooth transition into the career.
CO3	To gain field experience and get linked with the professional network.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	L	L	L	L	H	H	H	H	H	H	H
CO2	H	M	H	H	M	H	H	H	H	H	H	M
CO3	H	H	H	H	M	H	H	H	H	H	H	M

Cos / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	H	H	H	H	H		
CO2	H	H	H	H	H		
CO3	H	H	H	H	H		

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
							√					

Subject Code: BEE18TS3	Subject Name: TECHNICAL SKILL 3 (Evaluation of Design & Implementation Practice)	T /L/ ETL	L	T / S. Lr	P / R	C
	Prerequisite:	**L**	**0**	**0/0**	**3/0**	**1**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE:
The objective is to develop the technical skill of the students.

COURSE OUTCOMES (Cos): (3-5)

CO1	Develop the technical skills required in the field of study
CO2	Bridge the gap between the skill requirements of the employer or industry and the competency of the students.
CO3	Enhance the employability of the students.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	H	H	H	H	M	M	H	M	H	M
CO2	H	H	M	H	H	H	M	M	H	H	H	H
CO3	H	H	H	H	H	H	M	M	H	H	H	H

Cos / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	H	H	H	H	H		
CO2	H	H	H	H	H		
CO3	H	H	H	H	H		

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities And Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
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Subject Code: BEE18L12	Subject Name: PROJECT PHASE -I	T /L/ ETL	L	T / S.Lr	P / R	C
	Prerequisite:	**L**	**0**	**0/0**	**3/3**	**2**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE:

- The objective of the Main Project is to culminate the academic study and provide an opportunity to explore a problem or issue , address through focused and applied research under the direction of a faculty mentor. The project demonstrates the student's ability to synthesize and apply the knowledge and skills acquired to real-world issues and problems. This project affirms the students to think critically and creatively, find an optimal solution, make ethical decisions and to present effectively.

COURSE OUTCOMES (Cos): (3-5)

CO1	Apply the knowledge and skills acquired in the course of study addressing a specific problem or issue.
CO2	To encourage students to think critically and creatively about societal issues and develop user friendly and reachable solutions
CO3	To refine research skills and demonstrate their proficiency in communication skills.
CO4	To take on the challenges of teamwork, prepare a presentation and demonstrate the innate talents.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	**H**	**H**	**H**	**H**	**M**	**H**	**H**	**L**	**M**	**M**	**H**	**H**
CO2	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**M**	**M**	**M**	**H**	**H**
CO3	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**M**	**M**	**H**	**H**	**M**
CO4	**H**	**M**	**H**	**H**	**H**	**H**	**M**	**H**	**H**	**H**	**H**	**H**

Cos / PSOs	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**		
CO1	**H**	**H**	**H**	**H**	**H**		
CO2	**H**	**H**	**H**	**H**	**H**		
CO3	**H**	**H**	**H**	**H**	**H**		
CO4	**H**	**H**	**H**	**H**	**H**		

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
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Subject Code: BHS18FLX	Subject Name: FOREIGN LANGUAGE	T /L/ ETL	L	T / S.Lr	P / R	C
	Prerequisite:	**T**	**0**	**0/0**	**3/0**	**1**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE: : To recognize the cultural values, practices, and heritage of the foreign country, communicate effectively in a foreign language and interact in a culturally appropriate manner with native speakers of that language

COURSE OUTCOMES (Cos): (3-5)

CO1	Achieve functional proficiency in listening, speaking, reading, and writing.
CO2	Develop an insight into the nature of language itself, the process of language and culture acquisition.
CO3	Decode, analyze, and interpret authentic texts of different genres.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	L	L	L	L	H	L	H	M	H	H	L
CO2	M	L	L	L	L	H	L	H	H	H	H	L
CO3	L	L	M	M	L	H	M	H	M	H	H	L

Cos / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	L	L	L	L	L		
CO2	L	L	L	L	L		
CO3	L	L	L	L	L		

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
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Subject Code: BEE18L13	Subject Name: PROJECT PHASE - II	T /L/ ETL	L	T / S.Lr	P / R	C
	Prerequisite:	**L**	**0**	**0/0**	**12/12**	**8**

L : Lecture T : Tutorial SLr : Supervised Learning P : Project R : Research C: Credits
T/L/ETL : Theory/Lab/Embedded Theory and Lab

OBJECTIVE: The objective of the Main Project is to culminate the academic study and provide an opportunity to explore a problem or issue , address through focused and applied research under the direction of a faculty mentor. The project demonstrates the student's ability to synthesize and apply the knowledge and skills acquired to real-world issues and problems. This project affirms the students to think critically and creatively, find an optimal solution, make ethical decisions and to present effectively.

COURSE OUTCOMES (Cos): (3-5)

CO1	Apply the knowledge and skills acquired in the course of study addressing a specific problem or issue.
CO2	To encourage students to think critically and creatively about societal issues and develop user friendly and reachable solutions
CO3	To refine research skills and demonstrate their proficiency in communication skills.
CO4	To take on the challenges of teamwork, prepare a presentation and demonstrate the innate talents.

Mapping of Course Outcomes with Program Outcomes (POs)

COs/POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**
CO2	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**
CO3	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**
CO4	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**	**H**

Cos / PSOs	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**		
CO1	**H**	**H**	**H**	**H**	**H**		
CO2	**H**	**H**	**H**	**H**	**H**		
CO3	**H**	**H**	**H**	**H**	**H**		
CO4	**H**	**H**	**H**	**H**	**H**		

H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low

Category	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills			
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