



## PROGRAM SPECIFICATIONS (2020-2021)

BENHA UNIVERSITY

FACULTY OF ENGINEERING

Energy and Sustainable Energy Engineering Department

### Appendix: Course Matrix with program Competences:

Course Code	Course Name	Engineering Competencies (2018)										“Department” Sustainable Energy Competencies (NARS)			“Discipline” Sustainable Energy Competencies (ARS)			
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	D1	D2	D3	D4
EMP101	Engineering Mathematics (1)	√		√														
EMP103	Physics (1)	√	√					√										
EMP105	Engineering Chemistry	√	√					√										
EMP106	Engineering Mechanics (1)	√		√														
MDP101	Engineering Drawing (1)	√					√		√									
GEN101	English Language							√	√									
EMP102	Engineering Mathematics (2)	√		√														
EMP104	Physics (2)	√	√					√										
EMP107	Engineering Mechanics (2)	√		√														
CPE101	Computer Programming	√			√		√	√		√	√							
MDP103	Production Technology & Workshops		√				√			√								
MDP102	Engineering Drawing (2)		√		√				√									
GEN102	Engineering & Society			√	√													
EMP201	Engineering Mathematics (3)	√							√									
MPE201	Thermodynamics	√										√			√			



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MDP201	Materials Science	√	√									√						
MDP212	Manufacturing Technology	√		√							√	√						√
MDP203	Computer Aided Mechanical Drawing			√						√	√	√	√			√	√	
GEN201	Technical Report Writing							√	√									
EMP202	Engineering Mathematics (4)	√							√									
EMP203	Physics (3)	√							√									
MPE202	Fluid Mechanics	√										√						
MDP204	Mechanics & Testing of Materials	√		√							√	√	√					
EPM201	Electrical Engineering I	√	√											√				
GEN202	Psychology & Organization Behavior			√				√	√	√								
MPE301	Heat & Mass Transfer	√	√			√					√	√						
MPE302	Applied Fluid Mechanics	√	√	√		√						√						
ELC301	Electronic Engineering	√		√		√												
EMP311	Organic Chemistry	√				√					√							
MDP301	Machine Components Design			√	√							√	√					
EPM302	Electrical Engineering II	√	√											√				



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GEN301	Leadership and Management skills			√			√		√	√	√							
MPE303	Measurements & instrumentation Systems	√	√	√							√	√						
ESE380	Field Training I			√	√			√	√	√			√		√			
MPE304	Applied Thermodynamics	√							√		√	√		√				
EPM301	Electrical Power Engineering					√	√				√			√			√	√
MDP312	Theory of Machines	√										√		√				
MPE305	Numerical Methods for Engineers	√											√			√		
GEN302	Professional Ethics						√	√		√								
ESE411	Selected topics in Sustainable Energy			√		√										√		
MDP401	Vibration & Dynamics	√		√								√						√
EPM401	Electrical Machines		√	√										√				
ESE402	Fuel & Advanced Combustion	√		√									√		√			√
ESE410	Elective (1)			√	√					√		√	√		√			√
GEN401	Legislations, contract and procurement management						√			√	√							
ESE403	Energy & Conservation Management	√	√										√					√



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MPE401	Applied Heat & Mass Transfer	√	√	√		√					√	√						
ESE404	Bioenergy	√		√		√					√						√	
ESE405	Solar Energy	√	√	√		√						√	√			√		√
ESE412	Elective (2)	√			√	√						√						√
ESE480	Field Training II			√	√			√	√	√			√		√			
GEN402	Human Resources Management				√	√	√	√	√	√	√							
EPM402	Power System Analysis	√	√	√								√		√		√		√
ESE501	Energy Economics			√					√							√		
ESE502	Wind Energy	√	√	√		√						√	√			√		√
MDP501	Control Systems analysis & Design	√					√			√		√	√	√				√
ESE503	Solar Cells Fundamentals											√		√			√	
ESE510	Elective (3)				√	√				√		√	√		√			√
ESE591	Project (1)	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	
ESE504	Power Stations	√		√									√		√			√
ESE525	Computer Applications in Fluid Mechanics												√			√		
ESE506	Energy Storage & Transmission	√	√	√										√				√



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EPM501	Power Electronics		√				√							√				
ESE512	Elective (4)				√							√				√		√
ESE592	Project (2)	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	



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