KONERU LAKSHMAIAH EDUCATION FOUNDATION (KLEF)
DEPARTMENT OF MATHEMATICS
PROGRAM DEVELOPMENT DOCUMENT
M. Sc. (Applied Mathematics)
Y22-Batch

Vision of University:

To be a globally renowned university.

Mission of University:

To impart quality higher education and to undertake research and extension with emphasis on application and innovation that cater to the emerging societal needs through all-round development of students of all sections enabling them to be globally competitive and socially responsible citizens with intrinsic values.

VISION OF THE DEPARTMENT:

Department of Mathematics strives to be internationally recognised for academic excellence.

MISSION OF THE DEPARTMENT:

M1. To create an ambience of Mathematical thinking and applying the same to solve complex engineering problems.

M2. To Develop Mathematical model to solve problems at global level.

M3. To collaborate with other campus entities, individuals, professional associations and local community organizations.

Goals of the University:

1. To offer academic flexibility by means of Choice based credit systems and the like.
2. To identify and introduce new specializations and offer programs in emerging areas therein.
3. To incorporate into the curriculum the Application orientation and use high standards of competence for academic delivery
4. To design and implement educational system adhering to outcome based International models.
5. To introduce and implement innovation in teaching and learning process to strengthen academic delivery.

6. To offer academic programs at UG, PG, doctoral, Post-Doctoral which are industry focused, and incorporates Trans-discipline, inter-discipline aspects of the education system.
7. To deliver higher education that includes technologies and meeting the global requirements.

PROGRAME EDUCATIONAL OBJECTIVES:

The Program Educational Objectives (PEOs) are as follows:

PEO-1: Apply mathematics and technology tools (MATLAB) to solve problems.

PEO-2: Understand the use of mathematical tools and concepts in other fields.

PEO-3: Communicate, and work, with people of diverse backgrounds in individual and group settings, in an ethical and professional manner.

PEO-4: Critically analyze information and concepts to adapt to advances in knowledge and technology in the workplace.

PROGRAMME OUT COMES: (PO :)

Programme Outcomes

PO1 : To identify, formulate, abstract and analyze complex, real life or engineering problems using the principles of mathematical techniques.

PO2 : To apply the mathematical concepts in the fields of high end research and recognize their need and prepare for life long learning.

PO3 : To apply mathematics tools (MATLAB, R, and MINITAB) for a better decision making in complex situations.

PO4 : To maintain the core of mathematical and technical knowledge which is adaptable for solid foundation for lifelong learning.

PO5 : To apply ethical principles of mathematical techniques for the commitment of professional ethics, responsibilities and socio-economic needs of the society.

PO6 : Ability to do interdisciplinary research among allied subjects related to applied mathematics.

P07 : Use symbolic and numerical software as part of practical computation.

MappingofGOALSwithMISSION:

Academic Goals	MissionStatements			
	M1	M2	M3	
G1			√	
G2			√	
G3	√			
G4			√	
G5		√		
G6		√	√	
G7			√	

Mapping of PEOs with GOALS :

PEOs	AcademicGoals						
	G1	G2	G3	G4	G5	G6	G7
PEO1				√	√		√
PEO2		√				√	√
PEO3				√	√		
PEO4	√	√	√			√	

Thrust areas of M.Sc.(Applied Mathematics)			
LOCAL ***(APIIC)***	**REGIONAL** **(APIIC &*Industry Policy-Telangana*)**	**NATIONAL** ***(CII, NSDC)***	**GLOBAL** ***(World Economic Forum)***
Teaching Profession	Teaching Profession	Teaching Profession	Teaching Profession
I.T.Industry	I.T.Industry	I.T.Industry	I.T.Industry
		Industrial_Data Analyst	**Industrial_Data Analyst**
https://apindustries.gov.in/incentives/Data/APIndustrial_Policy_Brochure.pdf	http://industries.telangana.gov.in/Library/Industries%20Policy%20Book%202015.pdf	https://www.cii.in/PublicationDetail.aspx?enc=EybQ0l0ZfuOvvjXhsIi6HufXCGQ0P2eeL5OV8RB+1l0rIhqmDemCge6V5b1Dlacjo8566Ln57lacL9TgMOjIUmOZOi6Jr5TNtAoon0xFCfmwhuaMecXQQOIrqpZyDMP2FnxdXCR3LPk+qb+GfgfX9vgAnD6+W8FSrQ2lSgF545XgyQTMwEP/zp5UQKwidAVU	https://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf
https://www.rgukt.in/pdfdoc/GO142019HigherEducationDeptGovtofAP.pdf	https://www.aicte-india.org/downloads/reg-paydiploma_220110.pdf	https://www.aicte-india.org/downloads/reg-paydiploma_220110.pdf	https://www.aicte-india.org/downloads/reg-paydiploma_220110.pdf

Mapping of needs with Mission:

Local, Regional, National and Global Needs		Mission Statements			
		M 1	M 2	M 3	
LocalNeeds	Teaching Profession	√	√		
	I.T.Industry	√	√		
RegionalNeeds	Teaching Profession	√	√		
	I.T.Industry	√	√		
NationalNeeds	Teaching Profession	√	√	√	
	I.T.Industry	√	√	√	
	Industrial_Data Analyst	√	√	√	
GlobalNeeds	Teaching Profession	√	√	√	
	I.T.Industry	√	√	√	
	Industrial_Data Analyst	√	√	√	

Courses Introduced in 2022-23 Curriculum as per Local, regional, National and Global Needs:

Local, Regional, National and Global Needs		Courses introduced in 2019-20 curriculum as per identified needs
Local Needs	Teaching Profession	21AM1102- Ordinary Differential Equations 21AM1204-Numerical Analysis
	I.T.Industry	21AM1206- Technical Skills 21AM2104- Statistics with R Programming 21AM1104- Introduction to Computer Programming 21AM1202- Data Structures 20UC1102 - Design Thinking and Innovation
Regional Needs	Teaching Profession	21AM1102- Ordinary Differential Equations 21AM1204-Numerical Analysis
	I.T.Industry	21AM1206- Technical Skills 21AM2104- Statistics with R Programming 21AM1104- Introduction to Computer Programming 21AM1202- Data Structures 20UC1102 - Design Thinking and Innovation
National Needs	Teaching Profession	21AM1102- Ordinary Differential Equations 21AM1204-Numerical Analysis
	I.T.Industry	21AM1206- Technical Skills 21AM2104- Statistics with R Programming 21AM1104- Introduction to Computer Programming 21AM1202- Data Structures 20UC1102 - Design Thinking and Innovation
	Industrial_Data Analyst	21AM1206- Technical Skills 21AM2104- Statistics with R Programming 21AM1104- Introduction to Computer Programming 21AM1202- Data Structures
Global Needs	Teaching Profession	21AM1102- Ordinary Differential Equations 21AM1204-Numerical Analysis
	I.T.Industry	21AM1206- Technical Skills 21AM2104- Statistics with R Programming 21AM1104- Introduction to Computer Programming 21AM1202- Data Structures 20UC1102 - Design Thinking and Innovation
	Industrial_Data Analyst	21AM1206- Technical Skills 21AM2104- Statistics with R Programming 21AM1104- Introduction to Computer Programming 21AM1202- Data Structures

MAPPING OF PEOs with MISSION OF THE DEPARTMENT:

S.No	Description of PEOs	Key Components of Mission		
		M 1	M 2	M 3
		To create an ambience of Mathematical thinking and applying the same to solve complex engineering problems.	To Develop Mathematical model to solve problems at global level	To collaborate with other campus entities, individuals, professional associations and local community organizations.
PEO 1	Apply mathematics and technology tools (MATLAB) to solve problems.	. ✓.		.
PEO 2	Understand the use of mathematical tools and concepts in other fields.			✓
PEO 3	Communicate, and work, with people of diverse backgrounds in individual and group settings, in an ethical and professional manner.			✓
PEO 4	Critically analyze information and concepts to adapt to advances in knowledge and technology in the workplace	✓	✓	

MAPPING OF POs/PSOs with PEOs:

S No.	Key Components of POs and PSOs	Description of PEO			
		Apply mathematics and technology tools (MATLAB) to solve problems.	Understand the use of mathematical tools and concepts in other fields.	Communicate, and work, with people of diverse backgrounds in individual and group settings, in an ethical and professional manner.	Critically analyze information and concepts to adapt to advances in knowledge and technology in the workplace
		PEO 1	**PEO 2**	**PEO 3**	**PEO 4**
PO1	To identify, formulate, abstract and analyze complex, real life or engineering problems using the principles of mathematical techniques.	✓	✓		✓
PO2	To apply the mathematical concepts in the fields of high end research and recognize their need and prepare for life long learning.	✓	✓	✓	✓
PO3	To apply mathematics tools (MATLAB, R, and MINITAB) for a better decision making in complex situations.	✓	✓		✓
PO4	To maintain the core of mathematical and technical knowledge which is adaptable for solid foundation for lifelong learning.	✓	✓		✓

PO5	To apply ethical principles of mathematical techniques for the commitment of professional ethics, responsibilities and socio-economic needs of the society.		✓	✓	
PO6	Ability to do interdisciplinary research among allied subjects related to applied mathematics.		✓		✓
PO7	Use symbolic and numerical software as part of practical computation.	✓			✓

D. Program Articulation Matrix

S.No	Course Code	Course Name	Categor	L	T	P	S	Credits	PO								PSO			
									1	2	3	4	5	6	7	8	1	2	3	4
1	22AM1101	Real Analysis	Core	4	0	0	0	4		2			5	6	7		1			
2	21AM1102	Ordinary Differential Equations	Core	3	0	2		4			2		3				1	4	1	4
3	21AM1103	Discrete Mathematics	Core	3	1	0	0	4		2	3		5	6	7		2	3	3	3
4	21AM1104	Introduction to Computer Programming	Core	3	0	2	0	4	1						8		2	2	2	8
5	21AM1105	Mathematical Statistics	Core	3	1	0	0	4	1	2	3						2	1	2	2
6	21AM1106	Seminar-1	Core	0	0	2	0	1	1								1			
7	20UC1101	Integrated Professional English	HSS	0	0	4	0	2									1			

S.No	Course Code	Course Name	Category	L	T	P	S	Credits	PO											
									1	2	3	4	5	6	7	8	1	2	3	4
8	21AM1201	Abstract Algebra	Core	3	0	0	0	3	1	2	3	4					2	1	1	2
9	21AM1202	Data Structures	Core	3	0	2	0	4	1	2		4					1,2	1,2	1,2	1,2
10	21AM1203	Statistical Inference	Core	3	1	0	0	4	1	2	3						2	2	2	2
11	21AM1204	Numerical Analysis	Core	3	0	2	0	4	1	2	3						1	4	1	4
12	21AM1205	Complex Analysis	Core	3	1	0	0	4	1	2					7		1	4	1,4	1,4
13	21AM1206	Technical Skills	Skill	0	0	0	4	1	1	2							1,2	1,2	1,2	1,2
14	21AM1207	Seminar-2	Core	0	0	2	0	1	1	2							1	1	1	1
15	20UC1102	Design Thinking and Innovation - 1	Skill	1	0	0	4	2	1								1	1	1	1

S.No	Course Code	Course Name	Category	L	T	P	S	Credits	PO											
									1	2	3	4	5	6	7	8	1	2	3	4
16	21AM2101	Topology	Core	3	0	0	0	3	1								1,2	1.2	1,2	1,2
17	21AM2102	Partial Differential Equations	Core	3	1	0	0	4	1	2	3		5				1	4	1	1
18	21AM2103	Continuum Mechanics	Core	3	1	0	0	4			3	4					2	2	2	2
19	21AM2104	Statistics with R Programming	Core	3	0	2	0	4	1								1	1	1	1
20	21AM2105	Seminar-3	Core	0	0	2	0	1	1								1	1	1	1
21		Elective-I	Core	3	1	0	0	4	1								1	1	1	1
22	20UC1203	Design Thinking and Innovation - 2	Skill	1	0	0	4	4		1							1	1	1	1

S.No	Course Code	Course Name	Category	L	T	P	S	Credits	PO											
									1	2	3	4	5	6	7	8	1	2	3	4
23	21AM2201	Fluid Dynamics	Core	3	0	2	0	4												
24	21AM2202	Transform Techniques	Core	3	0	2	0	4	1		3	4		6					3	
25	21AM2203	Dissertation with Research Publication	Core	0	0	24	0	12												
26		Elective -I	Core	3	1	0	0	4												
27		Elective-III	Core	3	1	0	0	4												

Elective-I

S.No	Course Code	Course Name	Category	L	T	P	S	Credits	PO								P			
									1	2	3	4	5	6	7	8	1	2	3	4
1	21AM2106	Operations Research	Core	3	1	0	0	4			3						3			
2	21AM2107	Functional Analysis	Core	3	1	0	0	4												
3	21AM2108	Fuzzy mathematics and applications	Core	3	1	0	0	4												

Elective –II

S.No	Course Code	Course Name	Category	L	T	P	S	Credits	PO								P			
									1	2	3	4	5	6	7	8	1	2	3	4
1	21AM2204	Mathematical Modelling	Core	3	1	0	0	4	1								1			
2	21AM2205	Mathematical Control Theory	Core	3	1	0	0	4												
3	21AM2206	Dynamical Systems	Core	3	1	0	0	4												

Elective –III

S.No	Course Code	Course Name	Category	L	T	P	S	Credits	PO								P			
									1	2	3	4	5	6	7	8	1	2	3	4
1	21AM2207	Advanced Numerical Analysis	Core	3	0	2	0	4	1	2							1			
2	21AM2208	Number Theory	Core	3	1	0	0	4	1											
3	21AM2209	Applied Stochastic Processes	Core	3	1	0	0	4	1								1			