



PDA COLLEGE OF ENGINEERING, KALABURAGI
B.E. SYLLABUS FOR 2019
ADDITIONAL MATHEMATICS - I
(Mandatory Learning Course: Common to All Branches)
(A Bridge course for Lateral Entry students of III Sem. B. E.)

Course Code : 18MADIP31
Contact Hours/Week : 03
Total Hours: 40
Semester: III

CIE Marks :50
SEE Marks: 50
Exam Hours:03
Credits: 00

Course Objectives:

The mandatory learning course **18MATDIP31** viz., **Additional Mathematics-I** aims to provide basic concepts of complex trigonometry, vector algebra, differential & integral calculus, vector differentiation and methods of solving first order differential equations

Course contents	No. of Hrs
1. Complex Trigonometry: Complex Numbers: Definitions & properties. Modulus and amplitude of a complex number, Argand's diagram, De-Moivre's theorem (without proof). Vector Algebra: Scalar and vectors. Vectors addition and subtraction. Multiplication of vectors (Dot and Cross products). Scalar and vector triple products-simple problems	10
2. Differential Calculus: Polar curves-angle between the radius vector and the tangent pedal equation- Problems. Maclaurin's series expansions- Illustrative examples. Partial Differentiation: Basic concepts. Homogeneous functions of two variables- Euler's theorem-problems on first order derivatives only. Total derivatives- differentiation of composite and implicit function. Problems.	10
3. Integral Calculus: Statement of reduction formulae for $\int \sin^n x dx$, $\int \cos^n x dx$ and $\int \sin^m x \cos^n x dx$ and evaluation of these with standard limits-Examples. Double and triple integrals-Simple examples. Applications.	10
4. Vector Differentiation: Differentiation of vector functions. Velocity and acceleration of a particle moving on a space curve. Scalar and vector point functions. Gradient, Divergence, Curl (Definitions only). Solenoidal and irrotational vector fields-Problems.	10

Course Outcomes: On completion of the course, students are able to:

1. Understand the fundamental concepts of complex numbers and vector algebra to analyze the problems arising in related area.
2. Use derivatives and partial derivatives to calculate rates of change of multivariate functions.
3. Learn techniques of integration including double and triple integrals to find area, volume, mass and moment of inertia of plane and solid region.
4. Analyze position, velocity and acceleration in two or three dimensions using the calculus of vector valued functions.

Question Paper Pattern:

Note:- The SEE question paper will be set for 100 marks and the marks will be Proportionately reduced to 50.

- The question paper will have **Eight** full questions carrying equal marks.
- Each full question consisting of **20** marks.
- The students will have to answer **five** full questions

Text Book:

B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers, New Delhi, 43rd Ed., 2015.

Reference books:

1. *E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed., 2015.*

2. *N.P.Bali and Manish Goyal: Engineering Mathematics, Laxmi Publishers, 7th Ed., 2007.*

Course Title: GEOLOGY OF CERAMIC RAW MATERIALS		
Subject Code	19CC32	CIE: 50
Number of Lecture Hours/Week	3(Theory)	SEE: 50
Total Number of Lecture Hours	35+7=42 hrs(7hrs self study component)	SEE Hours: 03
Modules		Teaching Hours
Course Objectives To impart knowledge and enable students to understand: <ol style="list-style-type: none"> 1. Ceramics with historic perspective 2. Natural and synthetic ceramic raw materials 3. Manufacture of ceramic bodies 4. Manufacture and practical applications of conventional ceramics Manufacture, properties and applications of newer ceramics		
Module-1 Definition, classification and importance of composites. Ceramic fibers: Introduction, types of ceramic fibers –their fabrication, structure, properties and applications.		8
Module-2 Organic fibers, and metallic fibers - their fabrication, structure, properties and application. Comparison of properties of different types of fibers.		7+1 =8(7hrs self study component)
Module-3 Matrix materials: Polymers, metals and ceramic matrix materials. Interfaces–wettability and bonding, interface in composites, interactions at the interface, types of bonding at the interface. Tests for measuring interfacial strength.		8
Module-4 Polymer matrix composites, metal matrix composites, ceramic matrix composites- fabrication, properties and applications.		8
Module-5 Carbon fiber composites and multifilamentary superconducting composites. Nano composites. Elementary treatment of micro and macro mechanics of composites. Study on physical properties of composites-Strength, fracture, and fatigue.		10
Question paper pattern: Question paper shall contain five modules, each module containing two questions. Students shall answer any one question from each module..		
Reference Books: <ol style="list-style-type: none"> 1. # K. V. G. K. Gokhale , Principles of engineering Geology, BS Publications, New Delhi, India,3rd Edition ,2012. 2. # F.G. Bell, Fundamental of Engineering geology butterwoths, Publications, New Delhi, 3rd Edition, 1999 3. # David George Price, “Engineering Geology: Principles and Practice”, Springer, 2009. 		
Text Books <ol style="list-style-type: none"> 1. N. Chennkesavulu, Engineering Geology, Mc Milan India Ltd., New Delhi, India, 12th Edition 2009. 		

2. **Venkat Reddy** , Engineering geology, Vikas Publications, New Delhi, India,2nd Edition 2011.

3. **Parbin Singh**. “Engineering and General Geology”, Katson Publishers, 2009.

Course outcomes:

On completion of the course, the student will have the ability to:

Course Code	CO #	Course Outcome (CO)
	CO1	Define and classify the composites and understand the importance of composites
	CO2	Know the fabrication process followed for ceramic fibers, their properties, and applications. Will be in a position to compare the properties of different fibers.
	CO3	Explain the importance of interfaces their types. Outline the properties and applications of different matrix materials
	CO4	Explicate: manufacture process, properties and applications of different types of composites
	CO5	To give detailed information on Nano composites, multi filamentary and superconducting composites. Enlighten the micro, macro mechanics of composites. Information on physical properties like strength , fatigue fracture of composites

Course Title: Introduction to Ceramic Engineering		
Course Code	19CC33	Maximum marks CIE: 50
Number of Lecture Hours/Week	4	Maximum marks SEE: 50
Total Number of Lecture Hours	52	SEE Hours: 03
Prerequisite		
Course Objectives To impart knowledge and enable students to understand: <ol style="list-style-type: none"> 1.Ceramics with historic perspective 2.Natural and synthetic ceramic raw materials 3.Manufacture of ceramic bodies 4.Manufacture and practical applications of conventional ceramics 5. Manufacture, properties and applications of newer ceramics 		
Modules		Teaching Hours
Module I Definition, classification, applications, properties and scope of ceramics, ceramics versus metals and organics, historical perspective on the development of ceramics and ceramic industries. General flow diagram of preparation of ceramic articles with equipments used in making of ceramic articles. Newer ceramics versus traditional ceramics. (8 hours)		10
Module II Structure, classification and properties of Clays (Kaolin Montmorillionite) and feldspars. Structure, properties and polymorphism of quartz.Brief study of cornish stone, nepheline syenite, talc, steatite, pyrophyllite, sericite pyrophyllite, mica and synthetic raw materials. Calculation of percentage oxide content in clays, felspar and other raw materials (9 hours).		11
Module III Preparation of ceramic powders, mixing, preliminary idea of various shaping methods of ceramic articles; dry and semi dry uniaxial pressing, extrusion, jiggering and jollying, injection molding, slip casting, isostatic pressing, hot pressing, hot isostatic pressing, tape casting, machining methods. Drying of ceramics, biscuit firing and glost firing, action of heat on triaxial body. (9 hours)		10
Module IV Elementary ideas of classification, manufacture , properties and applications of conventional ceramics; Refractories, glass, whitewares and portland cement (8 hours)		11
Module V Newer ceramics: Classification – cermets and abrasives, electro-ceramics, bio-ceramics, space ceramics, super conducting ceramics, automotive ceramics. Common tests conducted on ceramics ;bulk density, apparent porosity, loss on ignition, drying shrinkage etc (8 hours)		10 5
Question paper pattern: Question paper shall contain five modules, each module containing two questions. Students shall answer any one question from each module.		

Text books:

1. Industrial ceramics - F. Singer and Singer S.S. Publisher Springer ISBN 978902752596

Reference Books:

1. Elements of Ceramics – F.H. Norton Publisher: Longman Higher Education; 2nd Revised edition (1 June 1974) ISBN-10:0201053063, ISBN-13:978-0201053067
2. Introduction to ceramics – W.D. Kingery et al, Publishers Wiley and Sons. ISBN-13: 978- 0471478607 2nd edition.
3. What every engineer should know about ceramics? – Solomon Mushikant Publisher Marcel and Dekker New York 1992.
4. Properties of Ceramic Raw Materials– W . Rayon Publishers Elsevier 2003
5. Ceramic whitewares – Rexford Newcomb, Jr., Pitman Pub. Corp., NY
6. Refractories – Manufacture, Properties and Applications – A. Rashid Chesti, Prentice Hall of India Pvt. Ltd.
7. Technology of Portland and blended Cements, Banerjee H.N published by A.H. Wheeler Publishing, Allahabad, Ed. 1980.
8. Abrasives – L. Coes Jr, Springer-Verlag 1971.
9. Modern Glass Practice – Samuel Ray Scholes, Charles H. Greene Publisher: Canners books 1975.
10. Advanced Technical Ceramics – Shigeyuki Somiya, Academic Press Inc., Harcourt Brace Jovanovich Publishers, 1984

E books and online course materials:

1. http://shodhganga.inflibnet.ac.in/bitstream/10603/108074/12/12_chapter%204.pdf
2. <http://www.scielo.br/pdf/mr/v20s2/1516-1439-mr-1980-5373-MR-2016-0915.pdf>

Course outcomes:

On completion of the course, the student will have the ability to:

Course Code	CO #	Course Outcome (CO)
16CC33	CO1	Describe ceramic materials and differentiate from other engineering materials C2
	CO2	Explain characteristics and calculate oxide content of various pure and natural and synthetic ceramic raw materials C3
	CO3	Explain and compare various shaping methods of ceramic articles
	CO4	Construct and explain flow charts for manufacture of conventional ceramics and explain properties applications of conventional ceramics C3
	CO5	Explain applications of various newer ceramics and tests conducted on ceramic and ceramic raw materials

THEORY COURSE TITLE: White wares and Heavy clay wares		
Subject Code	19CC34	CIE: 50
Number of Lecture Hours/Week	3(Theory)	SEE: 50
Total Number of Lecture Hours	52	SEE Hours: 03
Course Objectives To impart knowledge and enable students to understand: <ol style="list-style-type: none"> 1. Ceramics with historic perspective 2. Natural and synthetic ceramic raw materials 3. Manufacture of ceramic bodies 4. Manufacture and practical applications of conventional ceramics Manufacture, properties and applications of newer ceramics		
Modules		Teaching Hours
Module-I: Definition, Scope and division of field, geological formation, occurrence, raw materials- plastic raw materials , non plastic raw materials, non clay plastic raw materials .mining and treatment of ceramic raw materials. Triaxial composition, crystal structure and Properties of important ceramic raw materials.		12
Module-II: Auxiliary raw materials, Particulate solids and water role in different ceramic raw materials and in bodies. Batch calculation, inter-conversion of batch composition to formula and batch formula to composition. Rheology and types of fluids.		8
Module-III: Important shaping methods like jigging, jollying, slip casting, tape casting, extrusion, isostatic pressing, hot pressing , soft mud processes, plastic forming. Finishing, drying and firing of wares. Glazes: Definition, types of raw materials, coloring ingredients, decorating methods, compounding and firing of glazes, blending, preparation of glaze slip, glaze application.		12
Module-IV : Heavy Clay Wares: Definition of raw materials, classification of building materials, their chemical and mineralogical composition, clay preparation and shaping. Manufacture of common building bricks and roofing tiles, hollow bricks, sewer pipe, salt glazing. Microstructure of structural clay products		10
Module-V: Fine ceramics: Characteristics, Manufacture and properties of floor tiles, wall tiles, art ware, dental porcelain, bone china, abrasion resistance, porcelain, chemical stone wares, chemical porcelain, insulators, and metalized ceramics. Testing: Loss on ignition, plasticity, thermal shock, corrosion resistance, abrasion resistance, refraction, optical absorption, and crazing, lead solubility. General Plant Layout of white wares industries.		10

Question paper pattern:

Question paper shall contain five modules, each module containing two questions. Students shall answer any one question from each module.

Text books:

1. Industrial Ceramics – Singer and Singer, Springer Netherland publisher edition-1.
2. Ceramic Raw Materials – Ryan, William Ryan Pregamon Press, 1978.
3. Ceramic batch calculations – A.I. Andrews.
- 4 Ceramic Glaze Technology – Bull & Taylor, Pregamon press, 1986

Reference Books:

1. Fine Ceramics – F.H. Norton, Krieger pub. Co (June 1978)
- 2.. Introduction to Ceramics – W.D. Kingery, vol. 18, Wiley press, 1960..
3. Elements of Ceramics – Norton, Addison-Wesley Longeman publisher, 1974.
4. Introduction to White wares – Jackson Mac laren and sons Lt.publisher, London 1969.
5. Ceramics – P. William Lee, Reinhold publisher, 1961.
- 6 Ceramic white wares – Rexford Newcomb, Pitman publishing Corporation 1947.
- 7 .Heavy Clay wares – F.H. Clews, ACS publication, Academic Press, Newyork.

E-books and online course materials:

- 1.https://www.goodreads.com/book/show/2269166.Whitewares_Production_Testing_And_Quality_Control
- 2.https://books.google.com/books/about/Ceramic_Whitewares.html?id=vtWIAAAACAAJ
3. <https://phoenix.overdrive.com/phoenix-33/content/media/290620>
- 4.<https://www.routledge.com/Ceramic-Processing-Industrial-Practices/Sarkar/p/book/9780367727062>
- 5.https://books.google.com/books/about/Elements_of_Ceramics.html?id=bzvxAAAIAAJ
6. <http://www.hsbttutor.org.in/CeramicEngineering.html>
- 7.<https://www.worldcat.org/title/modern-ceramic-engineering-properties-processing-and-use-in-design-fourth-edition/oclc/1034612383>
8. <https://www.skillshare.com/browse/clay>
9. <https://www.skillshare.com/browse/pottery>
10. <https://www.britannica.com/art/whiteware>
11. <https://www.youtube.com/watch?v=PSHQxlbMNpE>
- 12.<https://www.facebook.com/JohnBrittPottery/videos/free-online-glaze-course-here-are-titles-of-videos-you-may-have-to-search-but-6-/466799357583201/>
13. <https://www.teachinart.com/glazing-made-easy.html>
- 14.<https://claystation.com/tag/online-glaze-course-pottery-ceramics-glazes-john-britt-johnbrittpottery-throwing-videos/>
- 15 .<http://www.lifeandart.in/online-ceramic-glazing-courses.html>

Course outcomes:

On completion of the course, the student will have the ability to:

CO #	Course Outcome (CO)
CO1	Describe occurrence, formation, Structure and properties of ceramic raw materials.
CO2	Explain role of water, rheology, and batch calculations.
CO3	Illustrate shaping methods , glaze preparation and glaze application
CO4	Discuss Characteristics, raw materials, manufacture heavy clay ware products
CO5	Explain manufacture of fine ceramics and testing of white ware products

Course Title: MECHANICAL OPERATIONS		
Subject Code	19CC35	CIE: 50
Number of Lecture Hours/Week	4	SEE: 50
Total Number of Lecture Hours	52	SEE Hours: 03
<p>Course Objectives To impart knowledge and enable students to understand:</p> <ol style="list-style-type: none"> 1. Ceramics with historic perspective 2. Natural and synthetic ceramic raw materials 3. Manufacture of ceramic bodies 4. Manufacture and practical applications of conventional ceramics <p>Manufacture, properties and applications of newer ceramics</p>		
Modules		Teaching Hours
<p>Module-I: Chemical technological process, block diagram, unit operations and unit processes – examples. Particle characteristics, equivalent particle diameter and sphericity and shape factor, mixed particle sizes, specific surface of mixture, average particle sizes.</p>		10
<p>Module-II: Screening: Screens – ideal and actual screens, standard (Taylor) screen series, differential and cumulative size analysis, graphical presentation. Effectiveness and capacity of screens. Industrial screening equipment such as trammels, vibrating screens, grizzlies. Sieve shakers. Miscellaneous separation processes such as magnetic and electrostatic separations, froth floatation, etc.</p>		10
<p>Module-III: Size reduction: Theory and principles (laws of size reduction) involved in crushing and grinding. Problems. Classification of size reduction machinery, their construction and working. Crushers, grinders, ultrafine grinders and cutters. Methods of operating crushers – Free crushing, Choke feeding, Open circuit grinding, Closed circuit grinding.</p>		12
<p>Module-IV: Filtration: Scope and importance, principles and types of filtrations: Constant rate and constant pressure filtration. Industrial filters and filter aids. Size enlargement – flocculation, briquetting, pelletization and granulation.</p>		10
<p>Module-V: importance of mixing in process engineering, types of mixing, mixing of solids, liquids and viscous masses, types of mixers used in process industries, principles, advantages and usefulness. Storage of solids, open and closed storage, bulk and bin storage. Conveyors – belt, chain, apron, bucket and screw conveyors</p>		10
<p>Question paper pattern: Question paper shall contain five units, each unit containing two questions. Students shall answer any one question from each unit.</p>		

Text books:	
1. McCabe W.L., et. al., “Unit Operations of Chemical Engineering”, 5 th ed., McGraw Hill International, Singapore, 2000.	
2. Badger W.L. and Banchero J.T., “Introduction to Chemical Engineering”, 3 rd ed., McGraw Hill International, Singapore, 1999.	
Reference Books:	
1. Brown G.G., et. al., “Unit Operations”, 1 st ed., CBS Publisher, New Delhi, 1995.	
2. Foust A.S., et. al., Principles of Unit Operations”, 3 rd ed., John Wiley & Sons., New York, 1997.	
E-books and online course materials:	
https://www.amazon.in/MECHANICAL-OPERATIONS-Fundamental-Principles-Applications-ebook/dp/B07Q616G6F	
https://www.pdfdrive.com/unit-operations-in-chemical-engineering-5th-edition-e185717953.html	
Course outcomes:	
On completion of the course, the student will have the ability to:	
CO #	Course Outcome (CO)
CO1	Explain unit operations and unit processes, define particle characteristics, determine particle sizes
CO2	Describe industrial and test screening equipment, analyze particle size distributions, explain miscellaneous separation methods
CO3	State and derive laws of size reduction and solve problems, describe various types of size reduction machinery
CO4	Explain various types of filtration methods, describe industrial filters and size enlargement methods
CO5	Explain mixing and mixing equipment, storage of solids and conveyors.

Course Title: ENVIRONMENTAL STUDIES		
Subject Code	19CV36	CIE: 50
Number of Lecture Hours/Week	2 Hours.	SEE: 50
Total Number of Lecture Hours	28	SEE Hours: 02
Pre requisites: None		
<p>Course Objective: To enable the student for acquiring the knowledge in the following topics.</p> <ol style="list-style-type: none"> 1. Understanding of ecosystem and describing the effects of human activities on environmental 2. Explaining the important of water, consequences of contamination of water and the importance of biogeochemical cycles. 3. Different types of energy source and environmental impact assessment 4. Types of environmental pollution and their effects. 5. Legal aspects related to environmental pollution and role of Government and NGO's in environmental protection. 		
Modules		Teaching Hours
<p>Module-1 Environment-Definition, Ecosystem-Balanced Ecosystem, Human Activities-Food Shelter, Economic and Social Security. (06.Hours)</p>		10
<p>Module-2 Effect of human activities on Environmental-Agriculture, Housing, Industry, Mining and Transportation activities. Natural Resources-water Resources-Agriculture and quality aspects. Water borne diseases, water induced diseases, fluoride problems in drinking water, mineral resources wealth, and material cycles-Carbon, Nitrogen and Sulphur cycles. (06.Hours)</p>		10
<p>Module-3 Energy-Different types of energy, Electromagnetic radiations, conventional and non conventional sources-Hydro Electric. Fossil fuel based, Nuclear. Biomass and Bio-gas. Hydrogen as an alternative future source of energy. Environmental impact assessment. Sustainable development. (06.Hours)</p>		10
<p>Module-4 Environmental pollution and their effects. Water pollution, Land pollution, Noise pollution, Public health aspects. Current Environmental issues and importance: population growth, Climate change and global warming effects, Urbanization, Automobile pollution (05.Hours)</p>		12
<p>Module-5 Acid Rain, Ozone layer depletion, Animal Husbandry. Environmental protection-Role of Government, legal aspect, Initiatives by Non-Government Organization (NGO) Environmental Education, Women's Education. (05.Hours)</p>		10

Question paper pattern: Student has to answer five full questions choosing one question from each module.		
Text books: 1. Environmental Studies- Smriti Srivastava 2. Environmental Studies- R Geeta Balakrishna 3. Environmental Studies- Benny Joseph 4. Environmental Studies- Dr. D. L. Manjunath 5. Environmental Studies- B.S. Raman		
E books and online course materials:		
Course outcomes: On completion of the course, the student will have the ability to:		
Course Code	CO #	Course Outcome (CO)
	CO1	Environmental Definition Ecosystem, food, shelter economic and social security. Balanced ecosystem
	CO2	Effect of human activities on Environment by Agriculture, housing, transportation. Industries Mining.
	CO3	Types of energy source, natural resources, water resources, Forest resources, Mineral resources, population growth. Sustainable development.
	CO4	Environmental pollution , water pollution, land pollution, noise pollution, climate change and global warming
	CO5	Acid rain, Ozone layer depletion. Environmental Education, women Education, NGO (Non Govt. Organization)

GEOLOGY LABORATORY		
Subject Code	19CCL31	CIE: 50
Number of Lecture Hours/Week	3 (PRACTICAL)	SEE: 50
Total Number of Lecture Hours	28	SEE Hours: 03

Course objectives:

This laboratory course will enable students to

- 1: Understand the various physical properties of minerals, and they can identify different types of Minerals
- 2: Understand the various optical properties of minerals. They can recognize special characteristics.
- 3: Understand the various physical properties of the rocks, and they can classify different types of rocks.

1 .Study of physical properties of the following minerals in hand specimens:
Quartz, Orthoclase, Albite, Oligoclase, Bitnowite, Anothite, Asbestose, Kayanite, Talc, Gypsum, Calcite, Flourite, Apatite, topaz, Correndum, Clay minerals, Fullers earth, kyonite, Hematite, megnatite, chromite, pyrolsite, psyllomelane, limonite, etc.

2. Study of optical properties of of the following minerals under petro logical Microscope.
Quartz, Orthoclase, Albite, Oligoclase, Bitnowite, Anothite, Asbestose, Kayanite, Talc, Gypsum, Calcite, Flourite, Apatite, topaz, Correndum, Clay minerals, Fullers earth, kyonite, Hematite, Megnatite, ,etc.

3. Study of Physical properties of the following rocks in hand specimens

IGNEOUS ROCKS: Granite, Pegmatite, Syanite, Felsites, Diorite, Dolerite, Gabroo, Basalt and there different verities.

SEDIMENTARY ROCKS: Conglomerate, Breccia, Sandstone, Limestone, Laterite, Shale, and their different verities.

METAMORPHIC ROCKS: Gneiss, Schist, Quartzite, marble, slate, phyllite and their different verities.

Course Outcome: At the end of the course Students will be able to
CO1: Identify various Minerals based on their physical properties (C1)
CO2: Classify /recognize minerals based on physical properties (C2)
CO3: Judge the use of minerals for varies applications (A3)
CO4: Determine the properties of various rocks with respect to ceramic field (C4)

Course Title: Pottery and Heavy clayware Lab (Activity lab)		
Subject Code:	19CCL33	CIE: 50
Number of Hours/Week	02	SEE: 50
Total Number practical Hours	42	SEE Hours: 03
List of experiments		
1. Case study and survey on pottery industry		
2. Case study and survey on building bricks industry		
3. Case study and survey on sewer pipe industry		
4. Salt glazing of heavy clay ware products		
5. Preparation of grog		
6. Study on effect of grog percentage on properties of Refractories		
7. Study on optimization of particle size for bricks/ refractory manufacture		
8. Determination of strength of heavy clay ware bodies		
9. Determination of water of absorption of heavy clay bodies		
10. Fabrication and testing of clay bodies		
11. Fabrication and testing of triaxial bodies		
12. Study on effect of composition on properties of triaxial bodies		
13. Study on hot floor drying		
14. Study on effect of drying on properties of heavy clay wares / triaxial bodies		
15. Study on effect of firing on properties of heavy clay wares and triaxial bodies		
16. Understanding and writing a report on applications of stokes law in particle size analysis		
17. Determination of particle size by Andersons pipette method		
18. Study of finishing of granite tiles / common tiles		
19. Study on extraction and processing of clays		
21. Fabrication of ultra light weight foam bricks for construction purpose as a sustainable materials		
22. Study on kilns and furnaces		
23. Synthesis of cement		
24. Synthesis of fly ash based cement		
25. Study on plain and smart concrete		
26. Study on Ceramic based paints		
27. Fabrication of paper crate		
28. Fabrication of fireclay refectories		
29. Decoration of pottery and heavy clay ware products		
30. Determination of water of plasticity of fire clay.		
31. Determination of adsorbed moisture of fire clay		
32. Determination of specific gravity of fire clay by pycnometer		
33. Determination of loss on ignition of fire clay.		
34. Determination of bulk density of fireclay body by Archimedes principle		
35. Determination of apparent porosity by Archimedes principle.		
36. Determination of optimum shape and size of supplied building bricks for construction		
37. Determination of optimum size and shape of building bricks for construction		
38. Synthesis of engobe		
Course outcomes:		
On completion of the course, the student will have the ability to:		
CO #	Course Outcome (CO)	

CO1	Study fabrication of pottery and heavy clay ware
CO2	Analyze properties of heavy clay ware
CO3	Determine suitability of heavy clay ware for applications
CO4	Fabricate and analyze properties of triaxial bodies, cement and concrete, engobe
CO5	Evaluate properties of clays used in heavy clay ware fabrication

**B.E. III/IV SEM.
SAMSKRUTHIKA KANNADA**

SUBJECT CODE	SUBJECT	STREAM	TH-TUT-PR	CREDITS
19KAK37	SAMSKRUTHIKA KANNADA	HUMANITIES AND SOCIAL SCIENCES (H.S.S)	2 - 0 - 0	01

CIE: 50

SEE : 50

SEE : 1 hours 30 Minutes

Total : 28 Hours

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕ

(ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ)

(ಕನ್ನಡಿಗರಿಗಾಗಿ - for Kannadigas - Common to all branches)

[As per Outcome Based Education (OBE) and Choice Based Credit System (CBCS) scheme]

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:

- ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡದ ಜೊತೆಗೆ ತ್ರಿಯಾತ್ಮಕ ಕನ್ನಡವನ್ನು, ಕನ್ನಡ ಸಾಹಿತ್ಯ, ಸಂಸ್ಕೃತಿ ಮತ್ತು ನಾಡು ನುಡಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
- ಕನ್ನಡದಲ್ಲಿ ತಾಂತ್ರಿಕ ವಿಜ್ಞಾನಗಳ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಹಲವಾರು ವಿಷಯಗಳನ್ನು ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
- ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

ಪರಿವಿಡಿ

ಭಾಗ - ಒಂದು ಲೇಖನಗಳು

ಕನ್ನಡ ನಾಡು, ನುಡಿ ಮತ್ತು ಸಂಸ್ಕೃತಿಗೆ ಸಂಬಂಧಿಸಿದ ಲೇಖನಗಳು

೧. ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ : ಪಂಪ ನಾಗರಾಜಯ್ಯ
೨. ಕರ್ನಾಟಕದ ಏಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ - ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯ
೩. ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ - ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೊ. ವಿ. ಕೇಶವಮೂರ್ತಿ *

ಭಾಗ - ಎರಡು

ಕಾವ್ಯ ಭಾಗ (ಆಧುನಿಕ ಪೂರ್ವ)

೪. ವಚನಗಳು : ಬಸವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ, ಜೇಡರ ದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ.
೫. ಕೀರ್ತನೆಗಳು : ಅದರಿದೇನು ಫಲ ಇದರಿದೇನು ಫಲ - ಪುರಂದರದಾಸ ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೆ - ಕನಕದಾಸ
೬. ತತ್ವಪದಗಳು : ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು - ಶಿಶುನಾಳ ಷರೀಫ
ಶಿವಯೋಗಿ - ಬಾಲಲೀಲಾ ಮಹಾಂತ ಶಿವಯೋಗಿ

೭. ಜನಪದ ಗೀತೆ : ಬೀಸುವ ಪದ, ಬಡವರಿಗೆ ಸಾವ ಕೊಡಬೇಡ

ಭಾಗ - ಮೂರು

ಕಾವ್ಯ ಭಾಗ (ಆಧುನಿಕ)

೮. ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ : ಡಿ.ವಿ.ಜಿ.
೯. ಕುರುಡು ಕಾಂಚಾಣಾ : ದ.ರಾ. ಬೇಂದ್ರೆ
೧೦. ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು
೧೧. ಹೆಂಡತಿಯ ಕಾಗದ : ಕೆ.ಎಸ್. ನರಸಿಂಹಸ್ವಾಮಿ
೧೨. ಮಬ್ಬಿನಿಂದ ಮಬ್ಬಿಗೆ : ಜಿ.ಎಸ್. ಶಿವರುದ್ರಪ್ಪ
೧೩. ಆ ಮರ ಈ ಮರ : ಚಂದ್ರಶೇಖರ ಕಂಬಾರ
೧೪. ಚೋಮನ ಮಕ್ಕಳ ಹಾಡು : ಸಿದ್ದಲಿಂಗಯ್ಯ

ಭಾಗ - ನಾಲ್ಕು

ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿ ಪರಿಚಯ, ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ

೧೫. ಡಾ. ಸರ್ ಎಂ ವಿಶ್ವೇಶ್ವರಯ್ಯ - ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ : ಎ ಎನ್ ಮೂರ್ತಿರಾವ್
೧೬. ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ
೧೭. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ.ಜಿ. ಬೋರಲಿಂಗಯ್ಯ

ಭಾಗ - ಐದು

ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ

೧೮. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ
೧೯. 'ಕ' ಮತ್ತು 'ಬ' ಬರಹ ತಂತ್ರಾಂಶಗಳು ಮತ್ತು ಕನ್ನಡದ ಟೈಪಿಂಗ್*
೨೦. ಕನ್ನಡ - ಕಂಪ್ಯೂಟರ್ ಶಬ್ದಕೋಶ*
೨೧. ತಾಂತ್ರಿಕ ಪದಕೋಶ : ತಾಂತ್ರಿಕ ಹಾಗೂ ಪಾರಿಭಾಷಿಕ ಕನ್ನಡ ಪದಗಳು*
* (ಅಧ್ಯಾಯ 3, 19, 20 ಮತ್ತು 21 ಇವುಗಳು ವಿಶಾಖಾ ಯದಿಂದ ಪ್ರಕಟಿತ " ಆಡಳಿತ ಕನ್ನಡ " ಪುಸ್ತಕದಿಂದ ಆಯ್ದು ಲೇಖನಗಳು - ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೊ. ವಿ. ಕೇಶವಮೂರ್ತಿ.



**B.E. III/IV SEM.
BALAKE KANNADA**

Subject Code	Subject	Stream	Th- Tut-Pr	Credits
19KAN37	BALAKE KANNADA	Humanities and Social Sciences (H.S.S)	2 - 0 - 0	01

: 50

SEE : 50

SEE :

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕ

baLake Kannada Text Book for VTU

(Common to B.Arch, B.Plan and B.E/B.Tech of all branches)

[As per Outcome Based Education (OBE) and Choice Based Credit System (CBCS) scheme]

Course Learning Objectives:

The course will enable the non Kannadiga students to understand, speak, read and write Kannada language and communicate (converse) in Kannada language in their daily life with kannada speakers.

Table of Contents

- Introduction to the Book
- Necessity of learning a local language:
- Tips to learn the language with easy methods.
- Easy learning of a Kannada Language: A few tips
- Hints for correct and polite conversation
- Instructions to Teachers for Listening and Speaking Activities
- Key to Transcription
- Instructions to Teachers

Part – I Lessons to teach and Learn Kannada Language

- Lesson – 1 ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ/ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು - Personal Pronouns, Possessive Forms, Interrogative words
- Lesson – 2 ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು - Possessive forms of nouns, dubitive question and Relative nouns
- Lesson – 3 ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative, Quantitative and Colour Adjectives, Numerals
- Lesson – 4 ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು – ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ – (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ) Predictive Forms, Locative Case
- Lesson – 5 ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು – Dative Cases, and Numerals
- Lesson – 6 ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು - Ordinal numerals

1 hour 30 Minutes

Total : 28 Hours

- and Plural markers
- Lesson – 7 ನ್ಯೂನ / ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು ಮತ್ತು ವರ್ಣ ಗುಣವಾಚಕಗಳು
Defective / Negative Verbs and Colour Adjectives
-
- Lesson – 8 ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತ್ತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು - Permission, Commands, encouraging and Urging words (Imperative words and sentences)
- Lesson – 9 ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು
Accusative Cases and Potential Forms used in General Communication
-
- Lesson – 10 “ಇರು ಮತ್ತು ಇರಲ್ಲ” ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು
Helping Verbs “iru and iralla”, Corresponding Future and Negation Verbs
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- Lesson – 11 ಹೋಲಿಕೆ (ತರತಮ), ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ
Comparitive, Relationship, Identification and Negation Words
-
- Lesson – 12 ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು
Different types of forms of Tense, Time and Verbs
-
- Lesson – 13 ದ್, -ತ್, - ತು, - ಇತು, - ಆಗಿ, - ಅಲ್ಲ, - ಗ್, -ಕ್, ಇದೆ, ಕ್ರಿಯಾ ಪ್ರತ್ಯಯಗಳೊಂದಿಗೆ ಭೂತ, ಭವಿಷ್ಯತ್ ಮತ್ತು ವರ್ತಮಾನ ಕಾಲ ವಾಕ್ಯ ರಚನೆ
Formation of Past, Future and Present Tense Sentences with Verb Forms
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- Lesson – 14 ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮತ್ತು ರಾಜ್ಯದ ಬಗ್ಗೆ ಕುರಿತಾದ ಇತರ ಮಾಹಿತಿಗಳು
Karnataka State and General Information about the State
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- Lesson – 15 ಕನ್ನಡ ಭಾಷೆ ಮತ್ತು ಸಾಹಿತ್ಯ -
Kannada Language and Literature
- Lesson – 16 ಭಾಷೆ ಕಲಿಯಲು ಏನನ್ನು ಮಾಡಬೇಕು ಮತ್ತು ಮಾಡಬಾರದು
Do's and Don'ts in Learning a Language
-
- Lesson – 17 PART - II
Kannada Language Script Part – 1
-
- Lesson – 18 PART - III
Kannada Vocabulary List : ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation
-