KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ

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NAAC Accredited
'A' Grade 2014

website: kud.ac.in

No. KU /Aca(S&T)/ RIH-290/CBCS/2020-21/ **315**   Date: **13 AUG 2020**

ಅಧಿಸೂಚನೆ

ವಿಷಯ: 2020–21ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಎಲ್ಲ ಸ್ನಾತಕ ಕೋರ್ಸಗಳಿಗೆ 1 ಮತ್ತು 2ನೇ ಸೆಮಿಸ್ಟರ್ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. ಮಾದರಿಯ ಪಠ್ಯಕ್ರಮವನ್ನು ಅಳವಡಿಸಿರುವ ಕುರಿತು.

ಉಲ್ಲೇಖ: 1. DO No. 1-1/2016(SECY), dt. 10.08.2016.
2. Academic Council Res. No. 2, 21.05.2020.
3. KU/Aca(S&T)/RIH-194/20-21/71, dt. 08.06.2020.
4. KU/VCS/2020-21, dt. 11.08.2020.
5. ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶ ದಿನಾಂಕ 13.08.2020.
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ಮೇಲ್ಕಾಣಿಸಿದ ವಿಷಯ ಹಾಗೂ ಉಲ್ಲೇಖಗಳಿಗೆ ಸಂಬಂಧಿಸಿದಂತೆ, 2020–21ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಎಲ್ಲ ಸ್ನಾತಕ ಕೋರ್ಸಗಳ 1 ಮತ್ತು 2ನೇ ಸೆಮಿಸ್ಟರ್ಗಳಿಗೆ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. ಮಾದರಿ ಪಠ್ಯಕ್ರಮವನ್ನು ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಅನುಮೋದನೆಯನ್ನು (Pending Approval of Academic Council Meeting) ನಿರೀಕ್ಷೆಯಲ್ಲಿರಿಸಿ ಅಳವಡಿಸಲಾಗಿದೆ.

ಮುಂದುವರೆದು, ಈ ಮೇಲಿನ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. ಪಠ್ಯಕ್ರಮವು ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲ www.kud.ac.in ದಲ್ಲಿ ಬಿತ್ತರಿಸಲಾಗಿದೆ ಎಂದು ಈ ಮೂಲಕ ತಿಳಿಸಲಾಗಿದೆ.

Hand 13/08/2020

(ಡಾ. ಹನುಮಂತಪ್ಪ ಕೆ.ಟಿ)
ಕುಲಸಚಿವರು

ಗೆ,
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ ಬರುವ ಎಲ್ಲ ಅಧೀನ ಹಾಗೂ ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ.

ಪ್ರತಿ ಮಾಹಿತಿಗಾಗಿ: ಡೀನರು, ಕಲಾ, ಸಮಾಜ ವಿಜ್ಞಾನ, ವಿಜ್ಞಾನ ಹಾಗೂ ತಂತ್ರಜ್ಞಾನ, ವಾಣಿಜ್ಯ, ಕಾನೂನು, ಶಿಕ್ಷಣ ಮತ್ತು ಮ್ಯಾನೇಜಮೆಂಟ್ ನಿಖಾಯ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.

ಪ್ರತಿ:
1. ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕುಲಪತಿಗಳ ಕಾರ್ಯಾಲಯ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
2. ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕುಲಸಚಿವರ ಕಾರ್ಯಾಲಯ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
3. ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕುಲಸಚಿವರು(ಮೌಲ್ಯಮಾಪನ) ಕಾರ್ಯಾಲಯ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
4. ನಿರ್ದೇಶಕರು, ಇಂಟರನೆಟ್ ಸೆಕ್ಷನ್, ಪರೀಕ್ಷಾ ವಿಭಾಗ, ಕವಿವಿ, ಧಾರವಾಡ.
5. ಅಧೀಕ್ಷಕರು, ಸಿಡಿಸಿ (ಸಂಯೋಜನೆ) ವಿಭಾಗ, ಕವಿವಿ, ಧಾರವಾಡ

Graduate Programme, B.Sc. (CBCS)

B. Sc. Mathematics Syllabus under Choice Based Credit System(CBCS)

B.Sc – I Semester   Proposed New Syllabus: 2020-21 onwards

[BMDSC] Paper 1.1: **Differential Calculus-I**

Unit 1 :
Real Numbers : Intervals . Absolute Values . Bounded and unbounded sets. Supremum and infimum of a set . Archimedean properties of real numbers. Neighbourhoods and limit points of a set.

Limits and Continuity : Definition of limit and continuity of a function in $\varepsilon - \delta$ form. Algebra of limits (with proof) and continuity (without proof). Boundedness of continuous function. Properties of continuous function. Intermediate value theorem. Uniform continuity – Definition. Theorems i) Uniform continuity implies continuity   and ii) continuity on closed interval implies Uniform continuity. Differentiability: Definition and problems on continuity as well Differentiability of a function**.**   **(25 hours)**

Unit 2 :
Higher Order Derivatives : The n^{th}derivative of $(ax + b)^m$, log $(ax + b)$, e^{ax},sin $(ax + b)$,cos $(ax + b)$, e^{ax}sin $(bx + c)$, e^{ax}cos $(bx + c)$. Leibnitz Theorem on n^{th} derivative of a product of functions and its application.

Mean Value Theorems : (Recap of Rolle's and Lagrange's theorems) Cauchy's mean value theorem. Monotonic functions; its applications in establishing some inequalities. Taylor's theorem (with Schlomilchand Rocheform of remainder). Maclaurin's theorem (without proof). Maclaurin's expansion of some standard functions.

(20 hours)

<u>**Reference Books:**</u>

1. Differential Calculus : Shanthi Narayan & P.K Mittal (S. Chand & Co.), 2010.
2. Advanced Calculus: B.R.Takur, G.P.Shrivastva & Bhanu Tripati Prasad and sons, 2005.
3. Advanced Calculus : Murry R. Spiegal (Schaum Series), 2010.
4. Mathematical Analysis : S. C. Malik (Wiley Eastern), 1992.
5. Text book of B.Sc. Mathematics : G.K. Ranganath and others, 2015.
6. Real Analysis : P.N. Chatterji, A Pragati edition, 2019
7. Real Analysis : Shanthi Narayan (S. Chand & Co.), 2005.
8. Real Analysis: Sharma and Vasishta, Krishna publications, 2014
9. A Course in B.Sc. Mathematics : Prof. Bhoosnurmath, C S Salimath & V S Shetiya
10. College Mathematics for B.Sc.: Dr. N. Rudraiah

[BMDSC] Paper 1.2 : Algebra

Unit 1 :

Set Theory : (Recap of operations on sets, equivalence relation) Indexed sets. Arbitrary union and intersection of sets. Generalized De'Morgan's Laws. Images , inverse images of functions. Set functions. Properties of set functions. Properties of composite functions. Countable and uncountable sets.

 Matrices: Row and column transformations in matrices. Rank of a matrix. Reduction to normal forms. Inverse of a matrix by elementary operations. Solution of system of linear equations. Necessary condition for a system of equation to be consistent.

Solution of system of linear equations by Gauss Elimination and Gauss-Jordan methods.   **(30 hours)**

Unit 2.

Theory of equations: (Recap of Quadratic equation: sum & products of roots and relation between the roots and coefficients). Factor theorem and remainder theorem. Cubic and Bi-quadratic equations, solution of the equations when Roots are in A.P, G.P and H.P. Irrational and complex roots. Solutions of equations by synthetic division.   **(15 hours)**

Reference Books:
1. Matrices by Shanthi Narayan (S. Chand & Co.), 2010.
2. Elements of Modern Algebra and Topology : Sampathkumar & K. S. Amur.
3. Matrices by M. Pille
4. Matrices: M.D. Raisighania, H.C, Sexena and H.K Das
5. Matrices: P.N. Chatterji
6. Theory of Equations by M.L. Kanna
7. Set Theory and related topics by Lipschotz:. -Schaum Series, 1998.
8. Elementary Set Theory: M.L Khanna, 1998.
9. A Course in B.Sc. Mathematics : Prof. Bhoosnurmath, C S Salimath & V S Shetiya
10. College Mathematics for B.Sc.:Dr. N. Rudraiah
11. A Text Book of B.Sc.Mathematics :G K Ranganath

Karnatak University Dharwad

Graduate Programme, B.Sc. (CBCS)

B.Sc – II Semester,   New Syllabus: 2020-21 onwards

[BMDSC] Paper 2.1**: Differential Calculus-II**

Unit 1.Differentiation in polar Co-ordinates. Plane curves in Polar and Pedal forms. Angle between the radius vector and the tangent. Angle of intersection of curves (polar form). Length of Polar tangent , normal, sub-tangent and sub-normal at any point on the curve. Length of perpendicular from pole to the tangent. Pedal equations. Derivative of an arc length of a plane curve.
(15 hours)

Unit 2.(*Recapitulation of Maximum and Minimum of a function*)
 Indeterminate forms: L- Hospital rule (Statement only). Evaluation of Limits using L-Hospital rule.
Concavity, Convexity and Points of inflexion of curves. Curvature of plane curves. Derivation of Radius of curvature in Cartesian, parametric and polar forms. Center of curvature. Evolutes & involutes, Envelopes of a plane curves.
Asymptotes of a plane curves: Asymptotes parallel to coordinate axes and oblique asymptotes, theorems and problems.
Tracing of curves: Definitions: Singular points, multiple points, Node, Cusp and isolated points. General rules for tracing of curves in Cartesian, polar forms. Examples on tracing of simple curves.   **(30 hours)**
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 Reference Books:

  1. Advanced Calculus: B.R.Takur, G.P.Shrivastva & Bhanu Tripati, Prasad and sons, 2005.
  2. Differential Calculus by Shanthi Narayan & P.K Mittal (S. Chand & Co.), 2010.
  3. Differential Calculus by N. P. Bali (Golden series), 2015.
  4. **A Course in B.Sc. Mathematics :** Prof. Bhoosnurmath, C S Salimath & V S Shetiya
 5. College Mathematics for B.Sc.:Dr. N. Rudraiah
 6. A Text Book of B.Sc.Mathematics :G K Ranganath

[BMDSC]   Paper- 2.2: **INTEGRAL CALCULUS AND GEOMETRY**

Unit 1. Integral Calculus: Reduction formulae for evaluating $\int \sin^n x \, dx$, $\int \cos^n x \, dx$, $\int \tan^n x \, dx$, $\int \sec^n x \, dx$, $\int Co\sec^n x$, $\int \cot^n x \, dx$, $\int x^n e^{ax} dx$ and $\int x^m (\log x)^n dx$ with definite limits. Application of definite integrals to area under a curve (only polar curves), volumes and surfaces of the solid generated by the revolution. Length of plane curves.

(20 hrs)

Unit 2. Analytical Geometry of three dimensions:

Sphere: Equation of a Sphere. Section of a sphere by a plane. Equation of a Sphere through a circle. Equation of a sphere with two given points as the ends of diameter, Tangent planes. Orthogonal spheres.

Cone: Equation of a cone. Quadric cone. Enveloping cone of a sphere. Right circular cone.

Cylinder: Equation of a cylinder. Enveloping cylinder of a sphere. Right   circular cylinder.

Coordinate geometry: Polar equation of the conic. Polar Equation of the directrix and tangent to the conic. Equation of asymptotes to the conic.   **(25 hrs)**

Reference Books:

1. Integral Calculus : Shanthi Narayan & P.K. Mittal, (S.Chand), 2005.
2. Integral Calculus by Vasishta , Sharma & N.P Bali, Krishna Publication, 2014.
3. Coordinate Geometry : M. L. Khanna
4. The elements of Coordinate Geometry : S.L.Loney, 2016.
5. A Course in B.Sc. Mathematics : Prof. Bhoosnurmath, C S Salimath & V S Shetiya
6. College Mathematics for B.Sc.:Dr. N. Rudraiah
7. A Text Book of B.Sc.Mathematics :G K Ranganath