Dr. A.P.J. Abdul Kalam University, Indore (M.P)

Scheme of Examination
B.Sc.
Semester-II
(w.e.f. July 2016 Onwards)

(Non Grading)

Course Name	Subject	Theory Max. Marks				Practical Max Marks		Total
		Internal		External		Max Marks	Min Marks	
		Max	Min	Max	Min			
Foundation Courses	HINDI+ ENGLISH **FCS 201 HE**	10+05=15	05	50+35=85	28	-	-	100
	E-SHIP **FCS 202 EP**	15	05	35	12	-	-	50
Computer Science	COMPUTER SCIENCE **BSS 201 T**	15	05	85	28	50	17	100
	COMPUTER SCIENCE **BSS 201 P**	-	-	-	-	50	17	50
	PHYSICS **BSP203 T**	15	05	85	28	50	17	100
	PHYSICS **BSP203 P**	-	-	-	-	50	17	50
	MATHEMATICS **BSM 201 T**	25	08	125	42			150
Total								600

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B.Sc. Under Graduate Semester wise Syllabus

(w.e.f. session 2016 onwards)

Class: - B.Sc.

Semester: - II Semester

Subject: - Computer science (BSS 201T)

Paper: - **PROGRAMMING AND PROBLEM SOLVING THROUGH C**

Marks 85+15 CCE

UNIT I

Algorithm, Flowchart, Logic Development & Problem Solving. Structure of C program, C declarations, keywords, identifiers, constants, variables, Data types, type conversion, Types of operators and expressions, Input and output functions in C.

UNIT II

Decision Statement – IF-ELSE statement, break, continue, goto, switch() case and nested IF statement. Loop Control Statements – For loop, While loop , Do-while loop and nested loops. Arrays – Definition, Initialization, characteristics, One, Two, Three and Multi-dimensional Arrays Working with scanf, printf, Strings & Standard Functions.

UNIT III

Pointers – Introduction, Features, Declaration & Arithmetic operations on pointers. Pointers and Arrays, Array of pointers. Pointers to pointers, pointers and strings, Void pointers Functions – Declaration, Prototype, Types of functions, Call by value and reference, Function with operators

UNIT IV

Function with decision statements, function with Loop statements. Function with Arrays and Pointers. Types of Storage Classes. Introduction to Files, Streams and File Types, Steps for file operations, File IO,

UNIT V

Files – Streams and file types, file operations Write and Other file functions.Command line arguments, Application of Command Line Arguments Structure and Union – Declaration, Initialization, structure within structure. Array of structure, Enumerated data types, Union of structure

TEXT BOOKS

1. *E. Balaguruswamy,* ***"Programming In C ",*** *TMH Publications*
2. *Kanetkar,* **"Let Us C"**

REFERENCES

1. Ashok N. Kamthane, "Programming with ANSI an Turbo C", Pearson Education

2. Ashok N. Kamthane et. al., Computer Programming and IT (for RTU), Pearson Education, 2011 (ISBN 978-81-317-5970-7)
3. *Mahapatra,* ***" Thinking In C ",*** *PHI Publications*

Problem Solving Skills Book:

1. *Gottfried, Schaums Outline Series,* ***" Programming With C "****, TMH Publications*

Note: Faculty teaching the subject will also given to students the besides 50 hours teaching the appropriate exercises and assignments. l.

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Subject: - Computer science (BSS 201P)

Paper: - **Practical on C Language**

(*Student Must Write 50 Programs including following* ***25*** *Programs in their Computer Practical Book with* **Algorithm/Flowchart)**

1. Write a program for swapping two variables without using third variable.
2. Write a program to calculate simple Interest and Compound Interest.
3. Write a program to convert temperature entered into centigrade to Fahrenheit.
4. Write a program to find maximum of three numbers.
5. Write a program to read in a three digit number produce following output (assuming that the input is 539)

5 hundreds
3 tens
9 units

6. Write a program to find sum of digits of accepted number.
7. Write a program to find student grade using IF-ELSE ladder
8. Write a program that prints given three integers in ascending order using IF- ELSE
9. Write a program for simple calculator using switch/case loop.
10. Write a program for print Fibonacci series up to N number.
11. Write a program to find sum of first 50 odd numbers and even numbers.
12. Write a program to find reverse of given number.
13. Write a program to find factorial of accepted number.
14. Write a program to find all prime number between two given numbers
15. Write a program to find minimum, maximum, sum and average of give one dimensional array.
16. Write a program for sparse matrix.
17. Write a program to find addition, subtraction, multiplication of matrix.
18. Write a program to print terms of each of the following series i. Sin(x) ii. Cos(x)
19. Display the following output on the screen a. b. c.

* 1 A
** 12 AB
*** 123 ABC
**** 1234 ABCD
***** 12345 ABCDE

20. Write a program to read and write a structure.
21. Write a program for factorial function.
22. Write a program to read a string and print its reverse.
23. Write a program to find a_b using Call by reference.
24. Write a program for create, open and append a file.
25. Write a program to copy the contents of one file to anoth

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B.Sc. Under Graduate Semester wise Syllabus

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Class: - B.Sc.

Semester: - II Semester

Subject: - Physics (BSP203T)

Marks 85+15 CCE

Unit-I: Thermodynamics-I

Reversible and irreversible process, Heat engines, Definition of efficiency, Carnot's ideal heat engine, Carnot's cycle, Effective way to increase efficiency, Carnot's engines and refrigerator,

Coefficient of performance, Second law of thermodynamics, Various statements of Second law of thermodynamics, Carnot's theorem, Clapeyron's latent heat equation, Carnot's cycle and its applications.Steam engine, Otto engine, Petrol engine, Diesel engine.

Unit II: Thermodynamics-II

Concept of entropy, Change in entropy in adiabatic process, Change in entropy in reversible cycle. Principle of increase of entropy, Change in entropy in irreversible process.

T-S diagram, Physical significance of Entropy, Entropy of a perfect gas, Kelvin's thermodynamic scale of temperature, The size of a degree, Zero of absolute scale, Identity of a perfect gas scale and absolute scale.

Third law of thermodynamics, Zero point energy, Negative temperatures (not possible), Heat death of the universe. Relation between thermodynamic variables (Maxwell's relations).

Unit-III: Statistical Physics- -I

Description of a system: Significance of statistical approach, Particle-states, System-states, Microstates and Macro-states of a system, Equilibrium states, Fluctuations, Classical & Statistical Probability, The equi-probability postulate, Statistical ensemble, Number of states accessible to a system, Phase space.

Micro Canonical Ensemble, Canonical Ensemble, Helmholtz free energy, Enthalpy, First law of thermodynamics, Gibbs free energy, Grand Canonical Ensemble.

Unit-IV: Statistical Physics- -II

Statistical Mechanics: Phase space, The probability of a distribution, The most probable distribution and its narrowing with increase in number of particles, Maxwell-Boltzmann statistics, Molecular speeds, Distribution and mean, r.m.s. and most probable velocity, Constraints of accessible and inaccessible states.

Quantum Statistics: Partition Function, Relation between Partition Function and Entropy, Bose-Einstein statistics, Black-body radiation, The Rayleigh-Jeans formula, ThePlanck radiation formula, Fermi-Dirac statistics, Comparison of results, Concept of Phase transitions.

Unit-V: Life and Contributions of Physicists

S.N. Bose, M.N. Saha, Maxwell, Clausius, Boltzmann, Joule, Wien, Einstein, Planck, Bohr, Heisenberg, Fermi, Dirac, Max Born, Bardeen.

Useful links for

Unit-V:

1. http://en.wikipedia.org/wiki/History of Physics
2. http://en.wikipedia.org/wiki/Nobel Prizes in Physics

Text and Reference Books:

1. **Heat and Thermodynamics:** Mark W. Zemansky, Richard H. Dittman, Seventh Edition, McGraw-Hill International Editions.

2. **Thermal Physics (Heat & Thermodynamics)**: A.B. Gupta, H.P. Roy, Books and Allied (P) Ltd, Calcutta.

3. **Heat and Thermodynamics:** Brijlal and N. Subrahmanyam, S. Chand & Company Ltd, New Delhi.

4. **Thermal and Statistical Physics:** K.M. Jain, South Asian Publication.

5. **Concept of Physics:** H.C. Verma, Bharati Bhavan Publishers.

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Class: - B.Sc.

Semester: - II Semester

Subject: - Mathematics (BSM 201T)

Paper: - Advanced Calculus, Differential Equations, Vector Calculus

Unit-1 Successive differentiation, Leibnitz theorem, Maclaurin and Taylor series expansions, Asymptotes, Curvature, Tests for concavity and convexity, Points of inflexion, multiple points, Tracing of curves in Cartesian co-ordinates.

Unit-2 Limit and continuity of functions of two variables, Introduction of Partial differentiation, Euler's Theorem on homogeneous function, Jacobians, Differentiability of real-valued functions of two variables, Taylor's theorem for functions of two variables, Double and triple integrals, Dirichlet's integrals.

Unit-3 Linear Differential equations and equations reducible to the linear form, Exact Differential equation, First order and higher degree equations Solvable for x, y and p, Clairaut's form and singular solutions, Linear differential equations with constant coefficients.

Unit-4 Homogenous linear ordinary differential equations, linear differential equations of Second order, Transformation of the equation by changing the dependent variable and the independent variable, Method of variation of parameters, Ordinary simultaneous differential equations.

Unit-5 Vector differentiation, Gradient, Divergence and Curl, Vector integration, Theorem of Gauss (without proof) and problems based on it, Theorem of Green (without proof) and problems based on it, Stoke's theorem (without proof) and problems based on it.

Texts Books:

1. Gorakh Prasad – Differential Calculus, Pothishala pvt. Ltd. Allahabad
2. Gorakh Prasad – Integral Calculus, Pothishala pvt. Ltd. Allahabad
3. D.A. Murray: Introductory Course in Differential Equations, Orient Long man, India 1967.
4. N. Saran & S.N. Nigam – Introduction to Vector Analyss, Pothishala Pvt. Ltd., Allahabad.
5. Murray R. Spiegel, Theory & problems of Advanced Calculus.Schaum's outline series, Schaum Publishing Co. NewYark.

Reference Books:

1. P.K. Jain and S. K. Kaushik, An introduction of Real Analysis, S.Chand & Co. New Delhi 2000.
2. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons 1999.
3. G. F. Simmons, Differential Equations, Tata Mcgraw Hill, 1972.
4. E.A. Codington, An introduction to ordinary differential equations, Prentice Hall of India, 1961.
5. H.T.H. Piaggio, Elementary Treatise on Differential equations and their applications, C.B.S. Publisher and Distributors, Delhi 1985.
6. W.E. Boyce and P.C. Diprima, Elementary Differential equations & Boundary Value problems, John Wiley 1986.
7. Murray R. Spiegel, Vector Analysis, Schaum Publishing Co. New York.
8. Shanti Narayan, A text book of Vector Calculus, S. Chand & Co., New