Department of Special Education
B.Sc. Special Education and Mathematics

Special Education:

Programme Outcomes:

1. Screen, identify and assess children with disabilities based on National and International classification and definition
2. Analyze family, community issues and resources and assist children with disabilities to improve and adapt to the environment
3. Design educational programmes based on the nature, causes and characteristics of children with disabilities
4. Examine the Individual needs for Education and Rehabilitation and problem solve net working with different stake holders.
5. Exhibit competency in assessment of disability for educational purpose and plan Individualized Programme.
6. Demonstrate use of educational and rehabilitative devices for different categories of children with disabilities
7. Apply skills, knowledge, evidence based practice in Schools, Family and Community for education and quality of life of individuals with disabilities.
8. Mobilize human, material, technology resources to improve education and thereby leading to enhanced quality of life
9. Acquire skills in the communicative language to advocate issues related to disability and thereby acquire leadership competency.
10. Predict and manage work environment with professional and entrepreneurial skills
11. Pursue life long learning with capacity as Alumini, registered Professional in Rehabilitation Council of India and Community Partners.

Programme Specific Outcomes:

1. Demonstrate knowledge on the concept of Special Education and Inclusive Education and Specify the Central and State Laws and Policies pertaining to individuals with disabilities.
2. Identify different categories of disabilities and interpret the Implications of disabilities for Educational purposes.
3. Apply appropriate instructional methods and technology for the education and rehabilitation of children with different categories of disabilities in the Inclusive School.

Mathematics:
Programme Outcomes:

1. Identify, formulate and analyze various mathematical, scientific and research problems.
2. Apply and advance the knowledge and skills acquired to become a creative professional in their chosen field.
3. Use modern tools, resources and software.
4. Solve complex scientific problems by conducting scientific derivations or mathematical simulations.
5. Engage in self-directed continuous learning, aimed at global competency, which will promote professional and personal growth.
6. Apply the skills and knowledge gained which leads to proficiency in analytical reasoning, professional ethics and also in modelling and solving real life problems.
7. Develop the logical approach to take decision, recognize patterns and distinguish between essential and irrelevant aspects of problems.
8. Convert vague concepts into precise form using Mathematics.
9. Excel in teaching profession and in government jobs.
10. Develop managerial skill and entrepreneurial skill by inculcating moral values and ethical values.
11. Demonstrate the ability to pursue higher studies and conduct research independently.

Programme Specific Outcomes:

1. Attain firm foundation in Mathematics and thereby able to incorporate the attained knowledge in recent technological advancements.
2. Competency to meet global challenges through critical, rational, analytical and logical thinking.
3. Proficient in entrepreneurship and leadership qualities and capable to work in diverse fields.

Part	Subject Code	Name of paper/component	Hours of Instruction / week		Scheme of Examination				
			T	P	Duration of Exam	CIA	CE	Total	Credit
		First Semester							
I	21BLT001/ 21BLH001/ 21BLF001	Tamil/Illakayam-I-Illakanam/IllakyaVaralaru Hindi / Prose and Non-detailed Text French	5	-	3	50	50	100	4
III		**Core Course I**							
	21BSEC01	Developments in Special Education	4	-	3	50	50	100	3
	21BSEC02	Assessment of Children with Learning Disabilities and Intervention	4	-	3	50	50	100	3
		Core Course II							
	21BSMC01	Analytical Geometry	5	-	3	50	50	100	3
	21BSMC02	Classical Algebra and Theory of Numbers	5	-	3	50	50	100	3
	21BSMC03	Differential Calculus	5	-	3	50	50	100	3
	21BSEI01	**DSE– I** – Introduction to Child Development (Human Development)	4	3	3	50	50	100	3
		Games	-	1	-	-	-	-	-
		Second Semester							
II	21BLE002	English – Language for Communication I	5	-	3	50	50	100	4
III		**Core Course – I**							
	21BSEC03	Implications of Visual Impairment	5	-	3	50	50	100	3
	21BSEC04	Educational Needs for Visual Impairment and Intervention –Practicum	-	3	3	50	50	100	2
		Core Course – II							
	21BSMC04	Integral and Vector Calculus	5	-	3	50	50	100	3
	21BSMC05	Trigonometry and Laplace Transforms	5	-	3	50	50	100	3

Part	Subject Code	Name of paper/component	Hours of Instruction / week		Scheme of Examination				
			T	P	Duration of Exam	CIA	CE	Total	Credit
	21BSMC06	Differential Equations	5	-	3	50	50	100	3
	21BSEI02	**DSE – II** – Allied Physics	4	-	3	50	50	100	3
	21BSEI03	Allied Physics Practical	-	3	3	50	50	100	2
		Games	-	1	-	-	-	-	-
	Internship in Schools / Centre (i. Visual Impairment and ii. Learning Disabilities) during Summer Vacation								
		Third Semester							
III		**Core Course – I**							
	21BSEC05	Assessment and Training of Low Vision	3	-	3	50	50	100	3
	21BSEC06	Implications of Hearing Impairment	5	-	3	50	50	100	3
	21BSEC07	Introduction to Locomotor Disability	3	1	3	50	50	100	3
	21BSEC08	Assessment and Intervention of Children with Hearing Impairment – Practicum	-	5	3	50	50	100	2
		Core Course – II							
	21BSMC07	Graph Theory	5	-	3	50	50	100	3
	21BSMC08	Statics	5	-	3	50	50	100	3
	21BSMC09	Practical I- Mathematical Programming in ANSI-C	-	4	3	50	50	100	2
	21BSEI04	**DSE – III** – Computer Applications in Special Education	2	3	3	50	50	100	4
		Fourth Semester							
		Core Course I							
	21BSEC09	Early Childhood Care and Education for Children with Special Needs	3	2	3	50	50	100	3
	21BSEC10	Introduction to Autism Spectrum Disorder	5	-	3	50	50	100	3
	21BSEC11	Speech and Language for Children with Special Needs	5	-	3	50	50	100	3
	21BSEC12	Orientation and Mobility – Practicum	-	3	3	50	50	100	2

Part	Subject Code	Name of paper/component	Hours of Instruction / week		Scheme of Examination				
			T	P	Duration of Exam	CIA	CE	Total	Credit
		Core Course II							
	21BSMC10	Special Functions and Fourier Series	5	-	3	50	50	100	3
	21BSMC11	Dynamics	5	-	3	50	50	100	3
	21BSMC12	Numerical Methods	4	-	3	50	50	100	3
		Interdisciplinary Course							
	21BSEI05	DSE IV Basic Mathematical Statistics (Mathematics)	4	-	3	50	50	100	3
Internship in Schools / Centre (i. Hearing Impairment and ii. Locomotor Disability) during Summer Vacation									
		Fifth Semester							
III		**Core Course I**							
	BSEC1321	Identification and Assessment of Intellectual Disability	5	-	3	50	50	100	3
	21BSEC14	Introduction to Multiple Disabilities	5	-	3	50	50	100	3
	21BSEC15	Assessment and Training of Intellectual Disability – Practicum	-	5	3	50	50	100	2
	21BSEC16	Assistive Technology for Persons with **(Self Study)** -Disabilities	1	-	3	100	-	100	4
	21BSEC17	Special Education and Mathematics (Computer Based test)	-	-	-	-	100	100	2
		Core Course II							
	21BSMC13	Abstract Algebra - I	5	-	3	50	50	100	3
	21BSMC14	Real Analysis - I	5	-	3	50	50	100	3
	21BSMC15	Complex Analysis - I	5	-	3	50	50	100	3
	21BSMC16	Discrete Mathematics	3	-	3	50	50	100	3
		Generic Elective (GE)	2	-	-	100	-	100	2
		Sixth Semester							
III		**Core Course I**							
	21BSEC18	Community Based Rehabilitation	3	2	3	50	50	100	3

Part	Subject Code	Name of paper/component	Hours of Instruction / week		Scheme of Examination				
			T	P	Duration of Exam	CIA	CE	Total	Credit
	21BSEC19	Management in Special Education and Rehabilitation	4	-	3	50	50	100	3
	21BSEC20	Individualized Educational Plan – Practicum	-	5	3	50	50	100	2
	21BSEC21	Introduction to Sign Language – Practicum	-	3	3	50	50	100	2
		Core Course II							
	21BSMC17	Abstract Algebra - II	5	-	3	50	50	100	3
	21BSMC18	Real Analysis – II	5	-	3	50	50	100	3
	21BSMC19	Complex Analysis - II	5	-	3	50	50	100	3
	21BSMC20	Operations Research	4	-	3	50	50	100	3
		Internship in Schools / Centres i. Intellectual Disability and ii. Autism Spectrum Disorder	-	-	-	-	-	-	-
	21BSEC22	Internship in Schools / Centres**	-	-	-	200	-	200	5
Total									**146**

**Internship at the end of 2ⁿᵈ & 4ᵗʰ semester and also during 6ᵗʰ semester

Part IV Components							
Semester	Subject Code	Name of paper / component	Hours of Instruction / week		Scheme of Examination		
			T	P	CIA	CE	Total Credits
Part IV Components							
		A. Ability Enhancement Courses *I. Ability Enhancement Compulsory Courses (AECC)*					
1	21BAES01	Environmental Studies	4	-	Remarks		4
2	21BAFU01	Fundamentals of Research	2	-	Remarks		2
5	21BSCS01	Communication Skills	3	-	Remarks		2
6	21BSSS01	Soft Skills	3	-	Remarks		2
		II Skill Enhancement Courses (SEC)					

3		Value Added Course (from a basket of choices offered)	40 hrs. Duration		Remarks	2
4		**Co-curricular Courses** Add on Certificate/ Quantitative Aptitude/ Certificate Courses- Gandhian Studies/ Women's Studies/ Ambedkar Studies/ GK/ Verbal and Non- Verbal Reasoning/General Awareness/others as per list	Varied duration		Remarks	2
B. Extra- Curricular Course						
1-6	**21BXNC01-06** **21BXNS01-06** **21BXSP01-06**	NCC NSS Sports (representing the University)	-	-	Remarks	24*** 6 6
Total Credits						**20**

*For the first four semesters there will be a minimum of two core courses/semester

**Project/Training /Internship: minimum 15 days (4 credits) – Maximum 30 days (6 credits) The above may be within the regular working hours or during the vacation of the 1 year and II year.

***For NCC Students alone 38 credits for Part IV Components

Total credits to earn the Degree

    1. Part I, II & III Components   -   146
    2. Part IV Components   -   20
                                              _____
          Total credits   -   166 Credits
                                              _____

 Other courses to be undergone by the students:

Other courses offered by the Department

    Discipline Specific Elective - 21BHDI03 DSE-III Education and
                                              Rehabilitation Approaches for Persons with b
                                              Disabilities (for Human Development students
                                              during Semester III)
    Generic Elective Course - 21BSEO01 Introduction to Disabilities
     Value Added Course - 21BSEV01 Orientation to Sign Language

Developments in Special Education

Semester I   **Hours of Instruction/week** : **4**
21BSEC01   **No. of Credits**   : **3**

Objectives:
The students are expected to
1. summarize the historical perspectives of Special Education
2. explain the concept, nature and characteristics of various disabilities
3. identify the types of sensory and neurological disabilities
4. examine the policies and legislations at the National and International levels.
5. estimate the current needs, trends and issues related to Education and Special Education.

Unit 1 Historical Perspectives of Special Education

Historical development in India and Abroad. Evolutionary process in attitudinal change towards persons with special needs. Philosophical approaches to Special Education, Psychological and Sociological perspectives of Special Education   **12**

Unit 2 Overview of Sensory Disabilities

Concept, nature, and characteristics of Visual Impairment, Concept, nature, and characteristics of Mental Retardation, Concept, nature and characteristics of Hearing and Speech impairment, Concept, nature and characteristics of Locomotor disability, Concept, nature and characteristics of Deaf Blindness   **12**

Unit 3 Overview of Neurological Disabilities

Concept, nature, and characteristics of Learning disability, Concept, nature, and characteristics of Behavioural and Emotional disorders, Concept, nature, and characteristics of Cerebral Palsy, Concept, nature, and characteristics of Autism, Concept, nature, and characteristics of multiple disabilities   **12**

Unit 4 Legislations for Special Needs Education & Rehabilitation

RCI Act (1992), National Trust Act (1999), UNCRPD (2006), Right to Education Act (2009), RPwD Act (2016)   **12**

Unit 5 Current Trends for Education of Children with Special Needs
          12
Mainstreaming , Inclusive Education, Cross Disability Approach, Open Distance Learning System, Parent and Community Involvement

                                                            Total Hours   60

Text Books :
1. Hambury. M. (2006). Educating Pupils with Autism Spectrum Disorders. New Delhi. Paul Chapman.

2. Narayan, J. (2003). Educating Children with Learning Problems in Primary Schools. Book for Teachers, Secunderabad, NIMH
3. Pebbett. K. (2006). Management of Cerebral Palsy. New Delhi. Sage Publishers.

Reference Books :

1. Madhubala. J. (2007). Hearing Impaired Students, New Delhi: Discovery Publishers.
2. Prasaad . J and Prakash. R (2007). Education of the Handicapped Children. New Delhi. Kanishka Publishers.
3. Reddy .G. L. and Kusuma. M. (2000). Education of Children with Special Needs. New Delhi. Discovery Publishers.
4. Rehabilitation Council of India (2003). Status of Disability in India – 2003, New Delhi. RCI.
5. Vijayan.P. and Geetha.T. (2006). Integrated and Inclusive Education. New Delhi. Kanishka Publishers.
6. Vijayan P. and Naomi V. G., (2005), Handbook: Education of Visually Impaired Children with Additional Disabilities. New Delhi. Rehabilitation Council of India.

Course Outcomes:
On completion of the course the student will be able to
1. describe the historical perspectives of special education
2. define different categories of sensory disabilities
3. predict the different types of neurological disabilities
4. restate the major national and international acts and policies for PwDs
5. outline the educational services for children with disabilities

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1		M		L			L		L			H		
CO 2	H		M	L	L								H	
CO 3	H		M	L	L								H	
CO 4							L		L	M		M		
CO 5			M				L			M	L	L		M

Assessment of Children with Learning Disabilities and Intervention

Semester I   **Hours of Instruction/week** : **4**
21BSEC02   **No. of Credits**   : **3**

Objectives:
To enable the students to:
1. describe the nature, causes and characteristics of children with specific learning disabilities
2. analyze the varied problems of children in reading, writing and mathematics and motor areas
3. administer various assessment tools and methods for screening of learning disability
4. analyze assessment reports and plan educational programmes for learning disability
5. manage learning disability and other associated conditions with various therapeutic interventions

Unit 1 Introduction to Learning Disabilities

10

Concept, Definition Causes, Characteristics of children with Learning Disabilities, Historical Overview and Theories related to Learning Disabilities, Prevalence / Incidence and International and National Scenario on LD, Neuro-developmental system and Understanding the Brain of the Dyslexic. Learning Process and Learning Styles.

Unit 2 Types and Characteristics – Dyslexia and Dysgraphia

Dyslexia -, Definition, signs and types of dyslexia, causes of reading disability **11** Components for a successful reading program. Phonological awareness, phonemic awareness, and basic sight words, spelling, fluency vocabulary and specific oral reading difficulty. Dysgraphia – Signs of dysgraphia, causes of errors in handwriting, pre requisite skills to hand writing. Disorders of spelling and remedial methods to teach spelling and writing skills.

Unit 3 Types and Characteristics of Dyscalculia and Dyspraxia

Dyscalculia: Acquisition of mathematical concepts, types, causes, characteristics and **13** remedial methods of teaching arithmetic skills. Dyspraxia: Motor disorders, signs and symptoms of dyspraxia. Tips for parents and teachers.

Unit 4 Identification, Screening and Referrals

Assessment – Need, scope and definition, Types of Assessment, Criterion Referenced **14** Tests (CRT) and Norm Referenced Tests (NRT), Teacher made tests, Curriculum Based Assessment (CBA), Functional assessment of life skills, Tools and methods for assessment of academic skills, reading, writing and mathematics Interpretation of test reports for educational programmes.

Unit 5 Learning Disabilities with Associated Conditions

12

Learning Disability with ADHD in the classroom - An overview. Management of children with behavioural and attention problems in the classroom, Behaviour therapy,

remediation and significance of counseling, Role of Therapists –occupational and language therapists - Collaboration between parents and schools.

Total Hours :   60

Text Books:
1. Jaya. N. and Geetha. T. (2009). Primary School Teachers Skills to Help Dyscalculic Children. New Delhi, Kalpaz Publications.
2. Jha. P. K. (2008). Learning Disabilities. New Delhi. Vistar Publishers.
3. Nakra. O. (2002). Students with Learning Disabilities. New Delhi. Macmillan Publishers.

Reference Books:
1. Narayan, J. (2003). Educating Children with Learning Problems in Primary Schools. Book for Teachers, Secunderabad, NIMH.
2. Sivasankari. R.L. (2005). Math-e- Magic Opening the Doors to Numbers. Chennai, Madras Dyslexia Association
3. Wong. B.Y. (2014). Learning about Learning Difficulties. San Diego, Elsevier Academic Press.

Course Outcomes:
On completion of the course the student will be able to
1. identify children with specific learning disabilities based on characteristics
2. explain the national and international perspectives concept & theories on learning disability
3. sketch the overview of the problems in various types of learning disabilities
4. application of tests / tools suitable to assess specific problems in academics among children
5. counsel parents, children and teachers for appropriate intervention and management.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H		L	L						M			H	
CO 2	M						L		L	L		L		
CO 3	H		L				L	L	L	M			M	
CO 4	M		M		H		L						M	
CO 5		M		M			M	L						M

11

Semester	Hrs of Instruction/week	:	5
21BSMC01	**No. of Credits**	:	3

Course Objectives:
1. To study properties of geometrical figures in two dimension and three dimension.
2. To learn both the procedural and the conceptual meaning of measurements.
3. To trace the conics.

Unit 1 Systems of Circles

Orthogonal circles - Coaxal systems - Properties and related problems. Pole, polar of Parabola - Ellipse - Hyperbola.　　**15**

Unit 2 Polar Equations

Representation of basic curves in polar coordinates.
General equation of Conic: Tracing the Conic - Properties and its applications.　　**15**

Unit 3 3D

Shortest distance - skew lines.
Sphere: Plane section of sphere - equation of tangent plane to sphere.　　**15**

Unit 4 Cone

Right circular cone - Intersection of straight line and quadric cone - tangent plane and normal.　　**15**

Unit 5 Condition for a cone to have three mutually perpendicular generators - **Central quadrics:** intersection of a line and a quadric.　　**15**

	Total hours	**75**

Text Books:
1. T. K. Manicavachagam Pillay and T. Natarajan (2007). "A Text Book of Analytical Geometry (Part I- Two Dimensions)", S. Viswanathan (Publishers and Printers) Pvt., Ltd.
2. T. K. Manicavachagam Pillay and T. Natarajan (2007). "A Text Book of Analytical Geometry (Part II- Three Dimensions)", S. Viswanathan (Publishers and Printers) Pvt., Ltd.

Reference Book:
1. Arup Mukherjee and Naba Kumar Bej. "Analytical geometry of Two and Three dimensions", Books and Allied Pvt., Ltd.

Course Outcomes:
　　Oncompletion of the course, the students will be able to
1. demonstrate the basic concepts of two dimensional objects.
2. identify conics in polar co-ordinates.
3. analyze basic properties of three dimensional objects.
4. apply the concepts of skew lines.
5. determine the equation in various forms of lines and a quadric.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	M	L		L	M			H	H		L	H	L	L
CO 2	H	L	L				M	M	M		M	L	M	L
CO 3	H		M	L	L	M	M	M	H		H	M	H	M
CO 4		H	H	H	M	L	H	H	H		H	M	H	H
CO 5	M	M	H	M		L	L	H	H	L	M	M	M	M

Classical Algebra and Theory of Numbers

Semester	**Hrs of Instruction/week**	**: 5**
21BSMC02	**No. of Credits**	**: 3**

Course Objectives:

1. To learn the properties of matrices.
2. To know the methods of finding roots and their relations with the coefficients of the polynomials.
3. To acquire the knowledge of Theory of Numbers.

Unit 1 Theory of Equations

Transformation of equations - Reciprocal equation - to increase or decrease the roots of an equation by a given quantity - Form of the quotient and reminder when a polynomial is divided by a quadratic polynomial - Descarte's rule of signs. **15**

Unit 2 Matrices Orthogonal

Matrices - Properties of orthogonal matrices - Eigen values and Eigen vectors - Diagonalisation of matrices - Similar matrices - Cayley - Hamilton Theorem. **15**

Unit 3 Theory of Numbers

Divisors of a given number N - Euler's function $\varphi(N)$ - Integral part of a real number - The highest power of a prime p contained in n! - The product of r consecutive integers is divisible by r! **15**

Unit 4 Congruences

Derivation of the criteria of divisibility of a number by 3,9,11 from the properties of congruences - Numbers in arithmetical progression - Testing the divisibility of f(x) by m for all integral values of x. **15**

Unit 5 More on theory of numbers

Fermat's Theorem - Generalization of Fermat's Theorem - Wilson's Theorem - Lagrange's theorem. **15**

Total hours	**75**

Text Books:

1. T. K. Manicavachagom Pillay, T. Natarajan and K. S. Ganapathy (2006). "Algebra Volume I", S. Viswanathan (Printers and Publishers) Pvt., Ltd. (Unit I)
2. T. K. Manicavachagom Pillay, T. Natarajan, and K. S. Ganapathy (2006). "Algebra Volume II", S. Viswanathan (Printers and Publishers) Pvt., Ltd. (Unit II, III, IV & V)

Course Outcomes:

On completion of the course, the students will be able to

1. identify and analyze the roots of polynomials.
2. construct the diagonal matrix through eigen values and vectors.
3. reproduce a number into product of prime numbers by factorization.
4. demonstrate the properties of congruences.
5. use Wilson's theorem and Fermat's theorem as the basis for primarily tests and factoring algorithm.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H			L			M	M		L	L	H	L	L
CO 2	L	H	H	M	L	M		L	M	L	M	H	M	M
CO 3		M	L	M	M		M	H	H	M	M	H	M	H
CO 4	M	M		M		L		M	M		H	M	M	M
CO 5		H	H	L	H	M			L		L	L	L	M

15

Differential Calculus

Semester	**Hrs of Instruction/week**	**:**	**5**
21BSMC03	**No. of Credits**	**:**	**3**

Course Objectives:

    1. To learn the techniques of calculus.
    2. To understand its applications in finding curvature, envelopes, etc.
    3. To learn evolute and involute.

Unit 1 Successive Differentiation

The nth derivative - Standard results - Trigonometric transformations - Formation of equations involving derivatives - Leibnitz formula for nth derivative of a product. **15**

Unit 2 Partial Differentiation

Partial derivatives of a function of two functions. **15**

Unit 3 Maxima, minima of functions of two variables. **15**

Unit 4 Envelopes:

Methods of finding envelopes**.**

15

Curvature: Circle, radius and center of curvature - Coordinates of center of curvature.

Unit 5 Evolute and involute:

Radius of curvature in polar coordinates - P-R equation - chord of curvature.

15

       Total hours   **75**

Text Book:

1. *Narayana.S and T. K. Manicavachagom Pillay (2009).**"Calculus Volume I Differential Calculus"***,** S. Viswanathan (Printers and Publishers), Pvt., Ltd., Chennai.

Course Outcomes:

On completion of the course, the students will be able to

1. demonstrate the concepts of successive differentiation.
2. discriminate the concepts of partial differentiation.
3. evaluate maxima and minima of functions of two variables.
4. understand the concept of envelopes and curvature.
5. estimate evolute and involute for the curves.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	M	H		M	M	M	M	H	M		M	M	M	M
CO 2	H	M		M	H	H	M	H	M		H	H	M	M
CO 3	L		M	H	L	M	L	M			L	M	M	L
CO 4		M	H					L				M	L	L
CO 5	M		L				L					L	L	L

Implications of Visual Impairment

Semester II   **Hours of Instruction/week** **:** **5**
21BSEC03   **No. of credits**   **:** **3**

Objectives:
To enable the students to:
1. describe the structure and functions of the human eye
2. explain the implications of visual impairment
3. explain the historical perspectives of the education of visually impaired and evolution of Braille
4. identify the basic psychosocial implications of visual impairment
5. classify the educational programmes for the visually impaired

Unit 1: Anatomy and Physiology of Human Eye

Structure of human eye- Physiology of Vision - Refraction and Refractive Errors- Definition and Classification of Visual Impairment - Common eye diseases and their implications- Prevalence and Incidence of Visual Impairment - Eye care and prevention of blindness. **15**

Unit 2: Effects of Visual Impairment

Berthold Lowenfeld's three basic limitations of blindness: Loss of range and variety of experiences, Loss of the ability to get around and Loss of the control of the environment and the self in relation to it. Effect of congenital (present from birth) and adventitious (acquired later) visual impairment - Myths, Stereotypes and Facts about visual impairment. **15**

Unit 3: History of Education of Visual Impairment

Origin of educational facilities to blind person in France- U.K, USA and India- Pre-Braille tactile script and origin and development of Braille script- Evolution of Braille- Computerized Braille **14**

Unit 4 : Expanded Core Curriculum (ECC)

Concept and Definition of Expanded Core Curriculum - Compensatory Skills: Orientation & Mobility – Social Interaction Compensatory Academics- Independent Living - Recreation and Leisure - Sensory Efficiency - Use of Technology - Career Education - Self Determination - Educational Devices **16**

Unit 5: Educational Programmes for the Visually Impaired

Cascade Service Delivery System- Special School Programme: Concept and Implementation- Inclusive Education: Concept & Implementation, IED-SSA, IED-SS, Role of Special Education Teachers, Role of Regular School Teachers in handling Children with Visual Impairment, Agencies Serving for Educational Programme - State & Central Government. **15**

Text Books:
1. Carroll,T.J.(1961) : Blindness: What It Is, What It Does And How To Live With It. Boston, Little Brown Co.
2. Kundu, C.L (Ed.) (2012), Status of Disability in India, Rehabilitation Council of India: New Delhi.
3. Lowenfeld, B. (1973), The visually handicapped child in school. John Day Company: New York
4. Mani, M.N.G. (2000), Inclusive Education - In Indian Context, Coimbatore, Sri Ramakrishna Mission Vidyalaya.
5. Naomi, V.G., Shanta, G and Manivannan, M (2011), Psycho-Social and Educational Implications of Children with Visual Impairment. New Delhi, Indira Gandhi National Open University.
6. Singh, J.P. (2007), Technology for the Blind -Concept and Context, New Delhi, Kanishka Publishers.
7. Vijayan, P & Geetha, T. (2006), Integrated and Inclusive Education, New Delhi, Kanishka Publishers.

Reference Books:
1. Ferrell, A.K, (2011), Reach Out and Teach: Helping Your Child Who Is Visually Impaired Learn and Grow, New York, AFB Press.
2. Holbrook, C.M, (2017), Foundations of Education: Volume II: Instructional Strategies for Teaching Children and Youth with Visual Impairments, New York, AFB Press.
3. Kitchlu, T.N. (1991), A Century of Blind Welfare in India. Delhi: Penman Publishers.
4. Larry Schwab (1987), Primary Eye Care in Developing Nations, Oxford University Press.
5. Reddy.G.L. (2000). Education of Children with Special Needs, New Delhi, Discovery Publishing House.
6. Salisbury, R (2007), Teaching Pupils with Visual Impairment: A Guide to Making the School Curriculum Accessible, London, David Fulton Publishers.

Course Outcomes:
On completion of the course the student will be able to
1. draw the structure of human eye, name parts and explain the physiology of vision with respect to various impediments leading to visual impairment
2. explain the effects of visual impairment on growth and development and plan remedies to bridge the gap
3. trace the evolution of education for the visually impaired
4. analyze the concept of expanded core curriculum and components of compensatory skills
5. critically analyse the different educational programmes and suggest appropriate services suitable for the individuals

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	M		M		L								M	
CO 2	L		H		L								H	
CO 3		M	M									M		
CO 4			L			M		M						H
CO 5	L	L	M		M		M		M	L		M		

Educational Needs for Visual Impairment and Intervention – Practicum

Semester II   **Hours of Instruction / week: 3**
21BSEC04   **No. of credits   : 2**

Objectives
To enable students to:
1. demonstrate skills in Braille reading and writing
2. competent to Braille type in simulation
3. demonstrate skills in operating Abacus and Taylor Frame for Calculation
4. acquire skills in teaching daily living skills to children with visual impairment
5. apply task analysis method in teaching daily living skills to children with visual impairment

Unit 1 Braille System

Seven line Braille System – English Alphabet – Dot Combinations, Other Signs used in English Braille, Punctuation, Capitalization, Italics, Numeric and Numbers   **9**

Unit 2 Braille Writing Devices
                                                                                        9
Practise on the use of Braille Writing Devices – Interline Frames, Inter point Frames, Mechanical Braillers, Pocket Frames – Reading and Writing Grade I Braille and Tamil Braille – Pre Braille Exercises

Unit 3 Use of Abacus for Calculation

Pre –requisite Skills to Abacus, Setting Numbers – Addition – Subtraction - Multiplication and Division -Application of Abacus Skills in Simulation.   **9**

Unit 4 Use of Taylor Frame for Calculation

Use of Taylor frame for Calculation- Writing of numbers and digits – writing of mathematical signs – Plus, Minus, Multiplication, Division etc. Writing and operating various Mathematical exercises - Addition, Subtraction, Multiplication and Division, Algebraic Calculation –Application of Taylor Frame Skills in Simulation.   **9**

Unit 5 Daily Living Skills (DLS) for Visually the Impaired

Teaching of DLS: Techniques of teaching DLS – Skills in Teaching : Brushing the Teeth, Toileting, Bathing, Eating, Dressing and undressing, Eating, Telephone use, Coins and Currency Identification, Body Hygiene, Washing Clothes, Teach DLS to a Visually Impaired Child and Record.   **9**

Total Hours :   45

Text Books:

1. Braille Primer with Exercises (1969), Standard English Braille. London. Royal National Institute for the Blind.
2. Mani,M.N.G.(2006), Braille – Instructions for Teacher Preparation in Tamil Nadu. Coimbatore. Ramakrishna Mission Vidyalaya Press.
3. Vijayan, P. & Victoria, N.G. (2009). Teaching Orientation and Mobility Skills to Persons with Visual Impairment. Coimbatore. Saradalaya Press.

Reference books:

1. Basu, H & Nath, T. (2009), Use of Taylor Frame: A Trilingual (English, Hindi & Bengali) Visual Guide, Kolkata. Society for the Visually Handicapped.
2. Mani, G (2005), Mathematics Made Easy for Children with Visual Impairment, International Council for Education of People with Visual Impairment (ICEVI), Ramakrishna Mission Vidyalaya Press, Coimbatore
3. Mani, M.N.G, (1995), Amazing Abacus. Coimbatore. Ramakrishna Mission Vidyalaya Press, Coimbatore
4. Punani, B and Rawal, N, (1993), Visual Handicap: Hand Book. New Delhi. Ashish Publishing House.
5. Rothstein, M.S, Braille Manual. USA. Howe Press, Perkins School for the Blind.

Course Outcomes:
On completion of the course the student will be able to
1. able to prepare and transcribe Braille reading and writing materials to children with visual impairment
2. operate Abacus for Calculation
3. use of Taylor Frame for arithmetic and algebraic calculation
4. facilitate performing daily living skills to children with visual impairment
5. use different Braille writing devices for Braille transcript

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	L	M	H	H	M	M	M	L			L	M	M	H
CO 2		M	H	H	M	H	M	L			L	M	M	H
CO 3		M	H	H	M	H	M	L			L	M	M	H
CO 4	M	M	H	H	M	M	M	M			L	M	M	H
CO 5		M	H	H	M	H	M	L			L	M	M	H

Integral and Vector Calculus

Semester II   **Hours of Instruction/week** : **5**
21BSMC04   **No. of credits**   : **3**

Course Objectives:

1. To evaluate multiple integrals.
2. To find volumes of solids.
3. To learn vector differentiation and integration.

Unit 1 Multiple Integrals:

Evaluation of the double integral - Double integral in polar coordinates - Triple **15**
integrals.

Unit 2 Application of Multiple Integrals:

Volumes of solids of revolution - Volume of solids as double integrals - Volume as a **15**
triple integral - Areas of curved surfaces.

Unit 3 Change of Variables:

15

Jacobian - Definition and results - Change of variable in the case of two variables and
three variables.

Unit 4 Vector Differentiation:

The Vector Differential Operator - Gradient -Direction and Magnitude of Gradient - **15**
Directional derivative of a scalar function - Definitions of Divergence and Curl -
Computing Divergence and Curl of vectors - Solenoidal and Irrotational vectors -
Criteria for vectors to be irrotational -Examples - Formulae involving Operator□.

Unit 5 Vector Integration:

Line Integral - Necessary and Sufficient condition for a line integral to be independent **15**
of its path of integration - Evaluation of Surface Integral - Evaluation of Volume
integral - Gauss Divergence theorem -Green's theorem - Stoke's theorem - (statements
only) Applications of the Theorems.

Total Hours : 75

Text Books:

1. S. Narayanan and T. K. Manicavachagom Pillay (2010). "Calculus Volume II Integral
   Calculus", S.Viswanathan (Printers and Publishers), Pvt., Ltd.
2. S. Narayanan andT. K. Manicavachagom Pillay (2009). "Vector Algebra and Analysis",
   S.Viswanathan (Printers and Publishers) Pvt., Ltd.

Course Outcomes:

On completion of course, the students will able to

1. evaluate double and triple integrals.
2. estimate areas of surfaces and volumes of solids.
3. utilize Jacobians to change coordinate systems.
4. demonstrate vector differential operators to identify solenoidal and irrotational vectors.
5. apply integral theorems to evaluate integrals.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	M			H	L	M	M	H	H			L	M	L
CO 2	M	M		M	M		H	M	M			H	M	L
CO 3	H	M	M	L	M	L		M	L			L	L	L
CO 4	H	L				M			L			M	M	M
CO 5	M	H		L	L	H	M	M	M			H	M	M

Trigonometry and Laplace Transforms

Semester II   **Hrs of Instruction/week: 5**
21BSMC05   **No. of Credits: 3**

Course Objectives:

1. To learn fundamentals of Trigonometry and Laplace Transforms.
2. To develop the skills of applications of Trigonometry and Laplace Transforms.
3. To know the scientific applications in industry.

Unit 1 Expansions:

Expansions of $cos\ n\theta$ and $sin\ n\theta$ - Expansions of $cos^n\theta$ and $sin^n\theta$ when n is a positive integer - Expansions of $sin\ \theta$ and $cos\ \theta$ in a series of ascending powers of θ. **15**

Unit 2 Formation of equations and Summation of Trigonometrical Series:

Examples on formation of equations - Sum of sines of n angles in A.P - Sum of cosines of n angles in A.P. **15**

Unit 3 Hyperbolic Functions and Logarithmic series:

Relations between hyperbolic functions -Inverse hyperbolic functions Logarithms of complex quantities -General value of logarithm of $x+iy$. **15**

Unit 4 The Laplace Transform and Inverse Laplace Transform:

Definition and properties of Laplace transforms - Laplace transform of periodic functions – Some general theorems - Evaluating certain integrals using Laplace transforms - The Inverse Transforms. **15**

Unit 5 Solutions of Differential Equations:

Solving ordinary differential equations - System of differential equations - Differential equations with variable coefficients using Laplace transforms. **15**

Total Hours   75

Text Books:

1. *S. Narayanan and T. K. Manicavachagom Pillay (2008). **"Trigonometry"**,* S. Viswanathan (Publishers and Printers) Pvt., Ltd. (Units I to III)
2. *S. Narayanan and T. K. Manickavachagom Pillay (2007). **"Differential Equations and its Application",*** S.Viswanathan (Printers and Publishers) Pvt., Ltd.(Units IV & V)

Course Outcomes:

On completion of the course, the students will be able to

1. demonstrate the knowledge on trigonometric functions.
2. construct the summation of trigonometrical series.
3. identify hyperbolic and inverse hyperbolic functions.
4. evaluate certain integrals using laplace transform.
5. applyLaplace transform to solve differential equations.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	M	M		L				H	H		M	H	L	L
CO 2	L	M	M				M	H		L		H	M	M
CO 3	H	H	M		L	M		M				L	L	L
CO 4	H	H							H	M	H	M	H	M
CO 5	H	H							H	M	H	M	H	M

Differential Equations

Semester   II   **Hrs of Instruction/week: 5**
21BSMC06   **No. of Credits: 3**

Course Objectives:
1. To understand the techniques of solving ordinary differential equations.
2. To reduce partial differential equations of first order into standard forms.
3. To acquire skill to solve partial differential equations of first order.

Unit 1 Differential equations of first order and of first degree and the applications:

Variables separable - Homogeneous and Nonhomogeneous equations - Linear Equations - Bernouilli's equations - Exact differential equations - Practical rules for solving an exact differential equation. **15**

Unit 2 Higher degree first order and second order linear differential equations:

Equations solvable for dy/dx - x and y - and its particular case - Linear equation with constant coefficients having particular integral of the form $e^{ax}V$ -where V is a function of x - Linear equations with variable coefficients. **15**

Unit 3 Second order linear equations with variable coefficients:

Special method of evaluating particular integral when X is of the form x^m - Equations reducible to the linear equations. **15**

Unit 4 Partial Differential Equations of the first order:

Classification of integrals - Derivation of Partial Differential Equations by elimination of constants - By elimination of arbitrary function -Langrange's method of solving the linear equation. **15**

Unit 5 Special methods of solving first order partial differential equations - standard forms - equations reducible to the standard form and Charpit's method. **15**

                                                Total Hours   75

Text Book:

1. S. Narayanan   and T.K. Manickavachagom Pillay (2006). **"Differential Equations and its Application"**, S.Viswanathan (Printers and Publishers) Pvt., Ltd.

Course Outcomes:

On completion of the course, the students will be able to

1. identify the types of ordinary differential equations.
2. apply suitable methods for solving first order and second order differential equations.
3. solve Second order linear equations with variable coefficients.

4. acquire knowledge to solve partial differential equations of first order.
5. classify Engineering and Physical science problems.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H		L			M			H		M	L	L	L
CO 2	M	M	H			M		M	H		H	M	M	M
CO 3	M	M	H			M		M	H		H	M	M	M
CO 4			M		H	M	L				H	M	H	M
CO 5		H	H			M			H	M		H	M	M

Assessment and Training of Low Vision

Semester III	**Hours of Instruction / week : 3**
21BSEC05	**No. of credits : 3**

Objectives:
To enable the students to :
1. identify types of vision loss in low vision
2. screen Impaired vision for educational purposes
3. assess the functional vision of children with low vision
4. plan educational programme for children with low vision
5. organize classroom facility to manage children with low vision

Unit 1 Concept of Low Vision

8

Low vision **- C**oncept & Definition, Characteristics of Children with Low Vision, Types of Vision Loss and its Implications.

Unit 2Identification and Assessment

Identification of Low Vision; Appearance, Behaviour and Complaints, Screening of 9
Impaired Vision, Distance Vision, Near Vision, Visual Field, Contrast Sensitivity and
Colour Vision - Commonly used Adapted Tests for Screening and Assessment.

Unit 3 Functional Vision Assessment

Functional Vision Assessment – Concept, Definition, Components, Need and 10
Importance, Vision Stimulation – Need and Activities for Vision Stimulation,
Functional Vision Assessment and Vision training for Enhancing Visual Efficiency,
Guidelines for Selecting and Preparing Objects / Materials to use for Assessment of
Visual Functioning and Testing Functional Vision.

Unit 4Education of Low Vision Children

Reading and Writing Programme for Children with Low Vision, Selecting Appropriate 9
Learning Medium – Programme for Developing Reading and Writing skills – Use of
Optical, Non-optical Devices and Electro Optical Devices for Children with Low
Vision.

Unit 5 Management of Low Vision Children

9

Classroom Management – Lighting - Environmental Modification - Orientation and
Mobility for Low Vision Children.

Total Hours :   45

Text Books :
1. Naomi, N.G. (2017), Low Vision Assessment and Educational Needs – A Guide to Teachers and Parents, India, Partridge Publications.

2. Sunitha.L, (2013), Guidelines for Comprehensive Growth of Low Vision in India, Haryana. Gurgaon, Vision 2020: The Right to Sight India Publishers.
3. Vijayan, P. & Victoria, N.G. (2005). Education of Children with Low Vision, New Delhi, Kanishka Publishers.

Reference Books:
1. Corn, A.L. (1983), Optical Devices in the Classroom, Peabody College, Vand Serbilt University. USA. Nashville,
2. Corn, A.L. and Erin, N.J. (2010), Foundations of Low Vision: Clinical and Functional Perspectives, 2ⁿᵈ Edition, New York, AFB Press.
3. Faye. E.E, (1984), Clinical Low Vision, Little Brown Publisher, University of Michingam, Ann Arbor.
4. Raju, M.S., (2010), Management of Vision Impairment - Low Vision, Vision Enhancement And Vision Rehabilitation. NewDelhi. Jayee Brothers Medical Publishers.
5. Rosenthal, P.B, (1996), Functional Assessment of Low Vision, 1ˢᵗ Edition, London, Mosby, U.K.

Course Outcomes

On completion of the course the student will be able to
1. differentiate the types of vision loss in low vision
2. demonstrate screening of impaired vision for education
3. perform functional vision assessment and functional vision training
4. propose individualized educational programme with appropriate use of devices for low vision students
5. adapt classroom environment for the education of low vision children

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	L	H	M	H	L	L						H	L
CO 2	H		H	H	M	M	M			L	L		H	M
CO 3	M	M	M	M	M		M	M	L	M		L	M	H
CO 4		L	H	H	M	M	M	L		M	L	L	M	H
CO 5		H	L	M	L	M	M	M	M	M	M		L	H

Implications of Hearing Impairment

Semester III   **Hours of Instruction / week : 5**
21BSEC06   **No. of credits   : 3**

Course Objectives:

To enable students to:
1. describe the mechanism of hearing
2. classify types of hearing impairment and its prevention
3. describe nature, characteristics and assessment of students with hearing impairment
4. summarize educational services for students with hearing impairment and the role of regular and special teachers
5. demonstrate competency on Intervention strategies for educationand rehabilitation of children with hearing impairment

Unit 1 Role and Mechanism of Hearing   **15**

Importance of hearing, Parameters of sound – Physiological, Psychological, Structure and Function of the Ear, Process of hearing, Auditory pathway and the auditory area in the brain. Speech banana, Threshold of hearing

Unit 2 Causes and Prevention of Hearing Impairment

Hearing Impairment - Definition, Causes, Signs and Symptoms of hearing impairment, **15** Prevention of hearing impairment. Characteristics of students with hearing impairment, Classification of hearing loss – Types, Level, Educational, Effects of pre-lingual and post lingual hearing impairment. Effects of hearing impairment on Language and communication, cognitive function, academic achievement and social development.

Unit 3 Assessment of Hearing

Developmental milestones of auditory behavior, Importance and strategies for early **15** identification. Assessment techniques – various types of audiological assessment – subjective and objective (PTA, Impedence, BERA, OAE, Cortical Evoke Response), Informal screening procedure – Free field, Behavioral Observation, Pure tone audiometer – parts and function, Interpretation of Audiograms.

  15

Unit 4 Amplification and Assistive Devices

Amplification Devices - Group Amplification Devices – Types and maintenance, , Hearing aids – Parts, Types and Functioning of hearing aids, Selection, Care and Maintenance of Hearing aid, Ear mould – Significance, types and preparation, Cochlear

Implantation, Simple repairs of a body level hearing aid and Role of the special educator.

Unit 5 Intervention Strategies and Rehabilitation

Developing communication skills in the hearing impaired –Oral-Aural, Auditory Verbal Method, Cued Speech, Manual, Total communication, Sign Language and Finger spelling, Maternal Reflective Method, Alternative and Augmentative communication. Essential Intervention Strategies - Visual and Auditory Perception, Auditory training. Educational placement in various set up – factors to be considered - various methods of teaching – Instructional Strategies to hearing impaired. Vocational placement – Skills to be taught - Jobs identified for the hearing impaired. **15**

Total Hours :   75

Text Books:

1. Rangasayee. R., (2007). Fundamentals of Hearing, Hearing Impairment and Audiological Management. New Delhi. Advance Books.
2. Reddy. G. L (2004). Hearing Impairment An Educational Consideration. New Delhi. Discovery Publishing House.
3. Sataloff, R. T. & Sataloff, J. (2005). Hearing Loss. (4th Ed.). London: Taylor & Francis.

Reference books:

1. Asmita.H, Rekha .M, Prabha. G, Varsha.G, (2006). Language and Communication. New Delhi. Kanishka Publishers.
2. Gathoo. V., (Ed.) (2006). Curricular Strategies and Adaptations for Children with Hearing Impairment. New Delhi. Kanishka Publishers.
3. Narayanansamy. S., Kansara. J., Rangasayee. R., (2006). Family, Community and the Hearing Child. New Delhi. Kanishka Publishers.
4. Relekar. S., (2006). Fundamentals of Speech and Speech Teaching. New Delhi. Kanishka Publishers.
5. Sharma. K, (2006). Aural Rehabilitation of Hearing Impaired Children. New Delhi. Sarup and Sons.

Course Outcomes:
On completion of the course the student will be able to
1. understand the characteristics of children with hearing impairment
2. acquire skills for identifying, assessing and rehabilitating children with hearing impairment
3. assess and apply intervention strategies to enhance learning skills of children with hearing impairment
4. familiarize with assistive devices in teaching children with hearing impairment

5. suggest appropriate educational and vocational placement and curricular strategies
    for
    students with hearing impairment

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	H	H	M	M	M	M	M	M	M	M	L	L	L
CO 2	H	M	M	M	M	L	M	M	M	L	L	M	L	L
CO 3	H	M	M	M	M	M	M	M	L	L	L	M	L	L
CO 4	L	L	L	M	L	L	L	M	L	M	L	L		M
CO 5	L	L	L	M	M	L	L	L	L	L	L	L	L	L

Introduction to Locomotor Disability

Semester III   **Hours of Instruction / Week : 3+1**
21BSEC07   **No. of credits   : 3**

Course Objectives:
To enable the students to:
1. describe the anatomy and physiology of human body
2. explain the common causes for locomotor disability and prevention
3. specify assistive devices, adaptive environment and vocational training for children with locomotor disability.

Unit 1 Human Anatomy , Physiology and Motor Disabilities   **9+3**

Anatomy and physiology of human body, skeletal system, neuromuscular system. Motor   Disabilities - Definition and classification. Incidence and life expectancy of motor disabled in India, Identification and early stimulation activities to the children with motor disabilities.

Unit 2 Causes and Prevention of Motor Disabilities in Children

9+3

Genetic counseling, Nutrition and Health education. Causes of motor disabilities - cerebral palsy, polio, muscular dystrophy, neuro-muscular conditions and epilepsy; Psychological and behavioural problems of children with motor disabilities.

Unit 3 Physical Care of Children with Motor Disabilities

Introduction to Orthotic and prosthetic devices in rehabilitation. Adaptation of indigenous environment, materials and aids - furniture's, learning devices, special peripherals, joysticks and touch screen. Architectural barriers, adaptive devices in public transport, toilets, home and institutions. Barrier Free Environment and Accessibility.   **9+3**

Unit 4 Family and Children with Motor Disabilities

Role of parents and problems faced in rearing children with motor disability, Role of parents in training in Daily Living Skills. Attitudinal building of parents, sibling and their peers. Psychotherapy and Counselling for parents and children.   **9+3**

Unit 5 Vocational Training for Children with Motor Disabilities

Special training needs, adaptation of machines, developing gadgets for the locomotor disabled, Job assessment and performance evaluation, methods of job identification for the locomotor disabled. Concept of Sheltered workshops, Transitory employment centre, On the job training centers, Job clubs, Work station. Self employment and role of a Special Employment Agencies, Agencies for manufacturing assistive devices for locomotor disability.   **9+3**

                                        Total Hours :   45+15

Text Books :
1. Bobalg, O. (2006). Teaching Students with Mental, Physical and Multiple Disabilities. New Delhi: Corwin Press.
2. Miller, F. and Bachrach, S.J. (2012). Cerebral Palsy: A Complete Guide for Care giving. Baltimore: A Johns Hopkins Press.
3. Reddy, G. L. & Ramar, R. (2000). Education of Children with Special Needs. New Delhi: Discovery Publishers.

Reference books:
1. Anson, D. K. (2018). Assistive Technologies for People with Disabilities, Greenwood.
2. Kochurani, P. J. (2016). Social Work Intervention with Persons with Locomotor Disabilities: A CBR Approach, Media House, Delhi.
3. Nicholes, Y., Doherty, H., Ibay, J., Schlenker, C. &Ibay, P. (2021). Always Room to Dance: Exploring Non-Locomotor Movement Words.
4. Ranganathan, S. (2018). Introduction to Multiple and Locomotor Disability, Kanishka Publishers, New Delhi.
5. Wong, A. (2020). Disability Visibility: First-Person Stories from the Twenty-First Century, (edited book), Vintage.

Course Outcomes:
On completion of the course the student will be able to
1. explain anatomy and physiology of human body and identify causes for motor disability
2. summarize the causes for motor disability
3. identify the devices appropriate for physical care
4. counsel parents of children with motor disability on care of their ward
5. select career option suitable to the uniqueness of motor disability.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO1	PSO 2	PSO 3
CO 1	M	M	L	L	L	L	L	L	L	L	L	M	M	M
CO 2	M	M	H	L	L	L	L	L	L	L	L	M	L	L
CO 3	M	M	M	L	L	H	H	M	L	L	L	L	L	H
CO 4	L	M	H	H	M	L	L	H	L	M	M	L	L	L
CO 5	L	L	L	L	L	L	L	L	H	H	M	M	L	H

Assessment and Intervention of Children with Hearing Impairment – Practicum

Semester III
21BSEC08

Hours of Instruction / week : 5
No. of credits   : 2

Course Objectives
To enable the students to:
1. screen children with hearing impairment
2. use various modes for communication
3. describe the functions , care and maintenance of hearing aids
4. prepare suitable teaching learning materials for children with hearing impairment.
5. demonstrate various approaches in teaching children with hearing impairment

Unit 1 Identifying Children with Hearing Impairment

Screening for hearing - Informal- Free field, Five sounds of Ling test, Weber, Rinne and Tuning fork test, Behavioral observation, Formal – Pure tone audiometry and Interpretation of audiogram for various types of hearing loss, Screening for speech recognition - Erber test(simple and complex level), Screening for speech production - Articulatory Battery Test, Behavioral observation.   **15**

Unit 2 Hearing Devices

Hearing aid - parts and function, selection of hearing aid, care and maintenance of hearing aid, Simple repairs of a body level hearing aid. Ear mould preparation and maintenance. Cochlea implantation – procedure and application of Auditory Verbal Therapy (AVT).   **10**

Unit 3 Teaching Learning Material

Concept of curriculum adaptation – importance for Children with Hearing Impairment, Concept of teaching learning materials, principles in preparation of teaching learning material. Preparation of Lesson plan. Preparing adaptive aids and teaching aid for concept teaching,   **15**

Unit 4 Modes for Educating Children with Hearing Impairment

Principles in selecting appropriate learning mode, Different mode – Oral mode - Maternal reflective method, Auditory Learning - Auditory training, factors conducive to auditory learning, Auditory Verbal Therapy, Manual mode - Sign Language, Finger spelling and Total Communication. Alternative and augmentative communication.   **20**

Unit 5 Presenting Case Study Report
.

Preparing case report. Planning and Implementing Individualized Educational Plan, lesson plan – speech, language, subject teaching, IEP meeting, interaction with parents.   **15**

Total Hours : 75

Text Books:
1. Gathoo. V., (Ed.) (2006). Curricular Strategies and Adaptations for Children with Hearing Impairment. New Delhi. Kanishka Publishers.

2. Martin, F. N. Clark, J.G. (2012). Introduction to Audiology. 11th ed. Boston: Pearson Education.
3. Mathew, S. (2010). Educational Evaluation .Curriculum and Teaching Strategies for Children with Hearing Impairment, MED SEDE (HI) Manual, New Delhi : IGNOU

Reference Books:

1. Narayanansamy. S., Kansara. J., Rangasayee. R., (2006). Family, Community and the Hearing Child. New Delhi. Kanishka Publishers.
2. Rangasayee. R., (2007). Fundamentals of Hearing, Hearing Impairment and Audiological Management. New Delhi. Advance Books.
3. Reddy. G. L (2004). Hearing Impairment : An Educational Consideration. New Delhi. Discovery Publishing House.
4. Relekar. S., (2006). Fundamentals of Speech and Speech Teaching. New Delhi. Kanishka Publishers.
5. Sharma. K, (2006). Aural Rehabilitation of Hearing Impaired Children. New Delhi. Swarup and Sons.

Course Outcomes:

On completion of the course the student will be able to

1. screen and identify children with hearing impairment in schools and community
2. assess and suggest assistive devices for the purpose of enhancing hearing ability
3. prepare case study and discuss assessment data in terms of speech, language and communication abilities
4. implement techniques of teaching speech, language and communication for children with hearing impairment
5. develop and use suitable teaching learning materials for children with hearing impairment in various setting

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	H	H	H	H	M	M	M	H	L	M	L	H	H
CO 2	H	M	H	M	M	H	L	L	M	L	L	L	M	H
CO 3	H	L	M	M	H	M	M	M	H	L	L	M	M	M
CO 4	M	M	H	H	H	H	H	M	H	L	L	H	H	H
CO 5	L	L	H	H	H	H	H	M	H	L	L	M	M	H

Graph Theory

Semester III   **Hrs of Instruction/Week** : 5
21BSMC07   **No. of Credits**   : 3

Course objectives:
1. To understand the fundamental concepts of graphs.
2. To learn the concepts of paths, circuits and trees in a graph and the concepts of Euler graph and Hamiltonian graph.
3. To explore the applications of graphs.

Unit 1

Graphs: Definition - Application - Finite and infinite graphs - Incidence and Degree - **15** Isolated vertex - Pendant vertex - Null graph.

Unit 2

Paths and Circuits: Isomorphism - Subgraphs - Walks - Paths - Circuits - Connected **15** Graphs - Disconnected Graphs and components.

Unit 3

Euler Graphs: Operations on graphs - More on Euler Graphs - Hamiltonian Paths and **15** circuits.

Unit 4

Trees: Definition - Some properties of Trees - Pendant vertices in a Tree - Distance and **15** centers in a Tree - Rooted and Binary Trees - Spanning Trees.

Unit 5

Cut sets and Cut vertices: Some properties of a cut set - All cut sets in a graph - **15** Fundamental circuits and cut sets - Connectivity and separability.

Total Hours   75

Text Book:

1. *Narsingh Deo(2007)*, **"Graph Theory with applications to Engineering and Computer Science"**, Prentice - Hall of India Private Limited, New Delhi.

Unit	Chapter	Sections
I	1	1.1, 1.2, 1.3, 1.4, 1.5
II	2	2.1, 2.2, 2.4, 2.5
III	2	2.6, 2.7, 2.8, 2.9

IV	3	3.1, 3.2, 3.3, 3.4, 3.5, 3.7
V	4	4.1, 4.2, 4.3, 4.4, 4.5

Reference Book:
1. J.A.Bondy, U.S.R.Murthy(1986), **"Graph Theory with applications",** *Elsevier, North Holland, Newyork.*

Course Outcomes:

On completion of the course, the students will be able to
1. understand the basic definitions and properties of graphs.
2. identify different kinds of special graphs.
3. apply the concepts of graph theory to relevant fields.
4. develop mathematical models using graph theory.
5. solve real world problems using graph theory.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	H	M	H	H	H	H	H	L	L	H	H	H	L
CO 2	H	H	M	H	H	H	H	H	L	L	H	H	M	L
CO 3	H	H	M	H	M	H	M	H	L	L	H	H	M	L
CO 4	H	H	M	M	H	H	H	H	L	L	H	H	M	L
CO 5	H	H	M	M	L	H	M	H	L	L	H	H	L	L

Statics

Course objectives:

1. To understand the concepts of forces.
2. To learn the applications of parallel forces, moments and couples.
3. To develop skills in the application of centre of gravity.

Unit 1

Forces acting at a point: Parallelogram of forces - analytical expression for the resultant of two forces acting at a point - triangle of forces - perpendicular triangle of forces - converse of the triangle of forces - the polygon of forces - Lami's theorem - an extended form of parallelogram law of forces - problems. **15**

Unit 2

Parallel forces and Moments: Introduction - like parallel forces - unlike parallel forces - conditions of equilibrium of three coplanar parallel forces - Center of two parallel forces - Moment of a force - Geometrical representation of a moment - Varignon's theorem - principle of moments - problems. **15**

Couples: Definition - equilibrium of two couples - equivalence of two couples - couples in parallel planes - representation of a couple by a vector - resultant of coplanar couples - resultant of a couple and a force - problems.
.
Unit 3

Equilibrium of three forces acting on a rigid body: Rigid body subjected to any three forces - three coplanar forces - two trigonometrical theorems - problems. **15**

Coplanar forces: Introduction - reduction of any number of coplanar forces - conditions for a system of forces to reduce to a single force or to a couple - equation to the line of action of the resultant - problems.

Unit 4

Friction: Definition - statical - dynamical and limiting friction - laws of friction - co-efficient of friction - angle of friction - cone of friction - equilibrium of particle on a rough inclined plane - equilibrium of a body on a rough inclined plane under a force parallel to the plane - equilibrium of a body on a rough inclined plane under any force - problems. **15**

Unit 5

Centre of gravity: Centre of like parallel forces - centre of mass - distinction between centre of gravity and centre of mass - determination of the centre of gravity in simple cases - C.G. of a uniform triangular lamina - centre of gravity by integration - C.G. of a compound body - C.G. of a remainder - problems. **15**

Equilibrium of strings: Uniform string under the action of gravity - equation of the common catenary - definitions - tension at any point - important formulae - geometrical properties of common catenary - problems.

Total Hours 75

Text Book:

1. *M. K. Venkataraman(2002).* **"A Text Book of Statics"**, Agasthiar Publications, Tenth edition.

Reference Book:

1. P. *Duraipandian(2007). Laxmi Duraipandian and Muthamizh Jayapragasam*, **"Mechanics"**, S.Chand & Company Ltd., New Delhi.

Course Outcomes:

On completion of the course, the students will be able to

1. Calculate the resultant of forces acting at a point.
2. Examine the resultant of like and unlike parallel forces.
3. Analysis of three forces acting on a rigid body.
4. Illustrate the problems involving frictional forces.
5. Determine the centers of gravity of simple geometric shapes.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	M	H		H	M	H	L		M		M	H	M	M
CO 2	H	H		H	M	H	L		M		M	H	M	L
CO 3	H	M		M	M	H	M		H		H	H	H	M
CO 4	H	M	L	H	M	M	M	M	H		H	M	M	M
CO 5	M	H	M	M	H	H	M		M		M	H	H	L

Practical I- Mathematical Programming in ANSI – C

Semester III   **Hrs of Instruction/week: 4**
21BSMC09   **No. of Credits: 2**

Course objectives:

1. To acquaint the students with computer.
2. To provide hands-on experience with the concepts of C language.
3. To acquire skill in solving problems through C programming.

Implementation of input and output operations.
Programs using operators and expressions.
Programs using if statement.
Programs using switch statement.
Programs using conditional operator.
Programs using while statement.
Programs using do while statement.
Programs using for statement.
Programs using One-dimensional &Two-dimensional arrays.
Programs using character arrays and strings.

Total hours: 60

Text Book:

1. *E.Balagurusamy(2008).***"*Programming in ANSI C*"**, Tata McGraw- Hill company Ltd.

Reference Books:

1. *Yashavant P. Kanetkar (2016).***"*Let us C*"**, BPB Publications, New Delhi.
2. *Byron s. Gottfried (2006).***"*Programming with C*"**, Schaum's Outlines, Tata McGraw Hill Publishing Company Limited, New Delhi.
3. *Kamthane A.N (2006).***"*Programming with ANSI and Turbo C*"**, Dorling Kindersley Pvt.. Ltd., Delhi.

Course Outcomes:

On completion of the course, the students will be able to

1. Understand and trace the execution of C program.
2. List out branching and looping statements.
3. Use arrays and strings of C language.
4. Design an algorithm for a given problem.
5. Develop a program for simple application of real life.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	H	H	M	H	H	M	M	L	M		M	M	L
CO 2	M	H	H	L	M	M	M	H	L			H	H	L
CO 3	H	H	H	M	M	H	M	H	M			H	H	L
CO 4	H	H	H	H	H	H	H	H	M	M	M	M	H	M
CO 5	H	H	H	M	H	H	M	M		M	M	M	H	M

DSE –III -Computer Applications in Special Education

Semester III + 3   **Hours of Instruction / week : 2**

21BSEI04   **No. of credits   : 4**

Objective:
To enable the students to:
1. demonstrate skills in using computers for teaching and learning
2. apply skills for using Worksheet
3. create PowerPoint for presentation
4. browse and collect we resources for teaching and learning
5. demonstrate skills in application of Special Software and Hardware

Unit 1 Introduction to Computer

6+9

Definition - Computer Components - Computer Hardware and Software, Software concept – System Software - Application Software - Operating System - Organizing Files and Folders - Introduction to Windows, Working with Windows Explorer

Unit 2 Introduction MS Word   **6+9**

MS Word, Features of MS Word, Working with Document, Formatting a document, Working with Objects, Inserting Picture - Page Number - Headers & Footers – Hyperlink - Word Art, Working with Tables, Mail Merge Concepts.

Unit 3 Introduction to MS Excel and PowerPoint Presentation

6+9

MS-Excel: Working with Worksheet, Simple Formula, Copying the Formula, Creating Charts, Working with Clip Art, Formatting Worksheet, Sorting and Filtering Records and Calculation of Worksheet by Applying Formulae.

MS-PowerPoint: Creating a Presentation, Working with Presentation, Viewing a Presentation, Using a Different Views, Using Hyperlink, Using Slide Show Features, Formatting and Animate the Presentation

Unit 4 Network and Internet Services

6+9

Networking – Concepts, Components, Types of Network, Advantages and Limitation of Network, Internet – Working of Internet, Uses of Internet, WWW Concept, Web Browsers, Web Services, E-mail – Introduction and Advantages, Structure and composing of an E-mail

Unit 5 Assistive Technology for the Differently Abled

6+9

Definition - Types of AT - Benefits of AT - Barriers of AT, Assistive Devices and Software for the Differently Abled - DAISY Book Production – Online Libraries (Bookshare)

Total Hours :   30+45

Text Books :
1. Nagpal. D.P, (2000), Mastering Microsoft Office 2000, A.H. Wheeler Publishing and Co., Ltd.
2. Young. M.L. (2009), Internet - The Complete Reference. New Delhi.Tata McGraw Hill Publishing Company Limited.
3. Willet E.C, (2003). Microsoft Office Bible, New Delhi, Willey India Pvt. Ltd.

Reference Books:
1. Willet. E.C. (2003). Microsoft Office Bible. New Delhi. Willey India Pvt. Ltd.
2. Hersh, M.A, (2007), Assistive Technology for Visually Impaired and Blind People Springer.
3. Rajaraman, V. (2003), Introduction to Information Technology. New Delhi. Prentice – Hall of India.
4. Mansfield,R. (2007), Working in Microsoft Office, New Delhi, Tata McGraw Hill Publishing Company Limited.
5. Stephen, L., (2000), The Complete Reference. New Delhi. Tata McGraw Hill Publishing Company Limited.

Course Outcomes:
On completion of the course the student will be able to
1. demonstrate skills in using computers for teaching and learning
2. prepare excel sheet for a given data.
3. develop PowerPoint Presentation for seminar
4. use internet and e-mail for learning and communication
5. demonstrate the use of special software for children with special needs.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	L	L	L	L	L	L	L	L		M		L	L	L
CO 2	L	L	L	L	L	L	L	L		M		L	L	L
CO 3	L	L	L	L	L	L	L	L		M		L	L	L
CO 4	L	L	L	M	M	M		M	M		L	L	M	H
CO 5	L	L	L	L	M	H	L	H	M	L	L	L	M	H

Early Childhood Care and Education for Children with Special Needs

Semester IV   **Hours of Instruction/week : 3+2**
21BSEC09   **No. of Credits   : 3**

Objectives
To enable the students to

1. explain the significance of early childhood special education
2. analyze child development process including physical, social, emotional, cognitive areas.
3. demonstrate skills in adapting curriculum and instructional methods for children with developmental delay
4. describe Early childhood educational services for Children with Special Needs
5. plan and execute suitable Early Childhood and Special Education programme

Unit 1 - Understanding Early Childhood Special Education

Early childhood special education - significance, nature and status - problems and issues. Emerging trends - various programmes. Concept of inclusion. Existing programmes and agencies involved in early childhood special - education   **9+3**

Unit 2 – Development Process in Children Across- (0 – 6 Years)

Principles of growth and development, Areas of development: physical, social, emotional, cognitive, language and moral development, Development of self-concept, Role of environment in promoting development of children with special needs, Process of promoting early childhood special education   **12+3**

Unit 3 - Curricular Areas and Adaptation

Content decisions - daily living skills - feeding, toileting, bathing, brushing, dressing, grooming and sleeping. Mobility and hand function skills, social and communication skills - self awareness, self expression and participation in groups. Concept formation – Principles and purpose of Curricular Adaptation. Type of curriculum: developmental, functional and ecological - Role of family, immediate environment and safety, pre-academics - pre-reading, pre-writing, pre-numbers and building school   readiness.   **9+9**

Unit 4 - Education Services

Various special educational service provisions, Need for home bound programmes. Centre based and home based - need and types, Strategies for intervention in various settings - rural and urban. Use of family and community resources in planning and implementation of Early Childhood and Special Education programme.   **9+9**

Unit 5 - Organization of Programmes

Organization of Early Childhood and Special Education programmes, Qualities of a special teacher in Early Childhood in Special Education (ECSE) programme,   **6+6**

Practicum:
- Visit Early Intervention Unit, Child Care Center and *Balwadi* programmes
- Interaction with Clinical and Medical Professional for detection of disability and delayed milestone
- Conducting awareness programme on Early Identification of Children with Disabilities
- Provide Parental training for care and education
- Visit to a Home Bound Programme and Community Based Rehabilitation Programme

Total Hours   45+30

Text Books :
1. Chalam, S. K. (2007). Introduction to Educational Planning & Management, New Delhi: Anmol Publications.
2. Jain, P. (2006). Curriculum & Teaching. New Delhi: Kanishka Publication
3. Mohanty.J. (2005). Educational Administration, Supervision and School Management, New Delhi: Deep & Deep Publications.

Reference Books :
1. Muralidharan, R. (1990). Early Stimulation Activities for Young Children. New Delhi: NCERT.
2. Narayan, J. (Ed.) (1999) School Readiness for children with special needs. Secunderabad: NIMH.
3. Reddy .G. L. and Kusuma. M. (2000). Education of Children with Special Needs. Discovery Publishers, New Delhi.
4. Romila, S. (1997) School Readiness programme. New Delhi: NCERT.
5. Vijayan.P. and Geetha.T. (2006). Integrated and Inclusive Education. Kanishka Publishers, New Delhi.

Course Outcomes:
On completion of the course the student will be able to
1. illustrate the significance of Early Childhood Education for Children with Special needs
2. describe the development process in children and milestone delay
3. use functional curriculum for children with special needs
4. outline various types of educational programmes for children with special needs
5. demonstrate competence to be special teacher for early childhood special education programme

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1		L	M	M	L		M	L		L		H		L
CO 2	H		L	M	M		L		L			L	M	
CO 3		L	H	M	M	M	M	L	L	L	L	M		H
CO 4			H	H	L	L	M	L	M	M		M		M
CO 5	M	L	H	M	H	L	L	L	L	M	H	M	M	H

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Introduction to Autism Spectrum Disorder

Semester IV
21BSEC10

Hours of Instruction / week : 5
No. of credits   : 3

Course Objectives:
To enable the students to:
1. explain causes and characteristics of children with autism spectrum disorder
2. identify and assess children with autism and plan remedial training
3. develop communication and behavioural interventions for children with autism

Unit 1 Concept of Autism

15

Definition and History - Causes of Autism – pre-natal, natal and post natal causes of Autism. Characteristics of Autistic behaviour, Intelligence and Special talents of Autistic children.

Unit 2 Screening and Assessment Procedure

Screening schedules for various age groups. Assessment - types of Assessment, standardized scales used for assessment of children with Autism – Childhood Autism Rating Scale (CARS), Indian Scale for Assessment of Children with Autism (ISAA), Diagnostic and Statistical Manual for Mental Disorders (DSMV). M-CHAT Screening Test for Autism.

15

Unit 3 Curriculum Planning and Classroom Management

Strategies for Classroom Management, Curriculum planning, Areas of curriculum for children with Autism, Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH), Structure, Positive Approaches and Expectations, Empathy, Low Arousal, LINKS (SPELL). Development of play in children with autism – Stages and Factors influence play in ASD, Intervention methods in teaching play. Neuro Cognitive Theories – Theory of Mind, Executive Functioning and Central Coherence.

15

Unit 4 Sensory Experiences for Children with Autism

Perception – Autistic way to perceive the world, perceptual styles and cognitive styles. Sensory issues in children with Autism and other sensory conditions. Strategies to cope up with sensory issues. Sensory integration therapy. Learning characteristics and styles – Selective attention, Motivation, Generalization, Transfer, Uneven cognitive profile, Visual vs Auditory Learning. Developments in the field of Autism – Global and Indian perspectives.

15

Unit 5 Intervention Strategies

15

Communication – Developing oral language comprehension and expression, Developing conversation skills, Echolalia, Using Alternative and Augmentative Communication, Behavioural management - Social skills – Using Social Stories,

Teaching key social rules, Using Cognitive Picture Rehearsal, Using Peer Support, Using Social Skills Training Groups. Using integrated play groups, Teaching self-management skills, Functional Skills – Self-care, Functional Academics, Vocational Skills, Leisure skills, Communication Skills, Therapeutic Interventions, interpersonal relationship, interventions and treatments. skill-based interventions and treatments, cognitive interventions and treatments, physiological / biological, neurological interventions and treatment.

Total Hours : 75

Text Books:
1. Accardo, P. J., Magnusen, C. and Capute, A.J. (2000). Autism: Clinical and Research Issues. Baltimore: New York Press.
2. Howlin, P. and Cohen, S.B. (2000). Teaching Children with Autism to Mind Read. England : Wiley and Sons.
3. Simpson, R. L. & Myles, B. S. (2008). Educating Children and Youth with Autism: Strategies for Effective Practice. (2ᵈ edition). Texas: Pro Ed.

Reference Books:
1. Buron, E. & Dunn, K.(2014). Learners on the Autism Spectrum: Preparing Highly Qualified Educators and Related Practitioners, AAPC Publishing; Shawnee KS, USA, 2ᵈ edition, (Edited book).
2. Grandin, T. & Panek, R. (2014). The Autistic Brain, UK, Rider.
3. Hall, L. (2017). Autism Spectrum Disorders: From Theory to Practice, Pearson; 3ʳ edition.
4. Osgood, T. (2019). Supportive Positive Behaviour in Intellectual Disabilities and Autism: Practical Strategies for Addressing Challenging Behaviour, UK, Jessica Kingsley Publishers.
5. Prizant, B. M. (2016). Uniquely Human, USA, Simon & Schuster
6. Sicile-Kira, C. (2014). Autism Spectrum Disorder, TarcherPerigee; Revised edition, USA.

Course Outcomes:
On completion of the course the student will be able to
1. demonstrate skills to identify children with autism spectrum disorder
2. be competent to teach and train children with autism spectrum disorder
3. use different assessment tools in assessing children with autism spectrum disorder
4. apply suitable therapeutic intervention for managing children with autism.
5. identify appropriate services to different categories of children with autism

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	M	L	L	L	L	M	L	L	L		M	L	M
CO 2	L	M	H	H	H	L	M	M	L	L		M	M	L
CO 3	H	L	M	L	L	L	L	L	L			L	H	L
CO 4	L	M	L	H	H	H	L	M	M	L	L	H	L	H
CO 5	L	M	H	H	H	H	M	M	L			L	H	H

Speech and Language for Children with Special Needs

Semester IV
21BSEC11

Hours of Instruction / week : 5
No. of credits   : 3

Course Objectives:
To enable the students to:
1. identify the speech and language needs of children with special needs
2. summarize approaches in language instruction and perform language assessment
3. describe development of speech and teach speech for children with special needs
4. acquire skills in evaluating speech of children with special needs

Unit 1 Introduction to Language

Definition, Structure and Function of language, innateness of language, Prerequisites and Phases of language acquisition, Development of Receptive and Expressive Language Skills of Normal children.   **15**

Unit 2 Approaches in Language Instruction

Assessment of Language - Methods of teaching language – Structural, Natural and Combined method, Special techniques of teaching language, Developing reading skills – activities for pre - reading skills, types of reading and Developing writing skills – activities for pre – writing skills, types of writing.   **15**

Unit 3 Assessment of Language

Meaning and definition. Scope and role of language assessment, Different types of assessment – Formal, Informal & Teacher made test - Problems of the hearing impaired related to basic language competence. Assessment of acquisition of basic language competence.   **15**

Unit 4 Development of Speech

Mechanism of speech production, Parameters of speech, Characteristics of Normal speech. Prerequisites and stages of speech development, Description of speech sounds. Classification of consonants & vowels – place and manner of articulation, Development of speech in children with and without hearing impairment, Speech as an overlaid function, Factors influencing development of speech and language in children with special needs   **15**

Unit 5 Teaching and Evaluating Speech of Children with Special Needs

Speech errors in children with special needs, different methods / approaches for teaching speech to children with special needs, Aids and equipment for development of speech. Oral peripheral mechanism examination, Evaluation of speech – phonetic and phonological profiling speech of children with special needs

15

Text Books :
1. Owens, R.E. (2012). Language Development: An Introduction (8th ed.) Boston: Pearson
2. Richards, J. (2001). Curriculum Development in Language Teaching. Cambridge: Cambridge University Press.
3. Speake, J. (2003). How to Identify and Support Children with Speech and Language Difficulties. London. LDA.

Reference Books:
1. Anderson, C., & Van Der, G. A. (2005). Speech and Language Therapy: Issues in Professional Practice. London. Whurr.
2. Asmita.H, Rekha. M, Prabha. G, Varsha. G, (2006). Language and Communication. New Delhi. Kanishka Publishers,
3. Kersner, M. (2001). Speech and Language Therapy: The Decision Making Process When Working with Children. London. David Fulton Publishers Ltd.
4. Paul, R., & Norbury, C. (2012). Language Disorders from Infancy through Adolescence: Listening, Speaking, Reading, Writing, and Communicating (4th ed.). Elsevier, Mosby.
5. Relekar. S., (2006). Fundamentals of Speech and Speech Teaching. New Delhi. Kanishka Publishers.

Course Outcomes:
On completion of the course the student will be able to
1. demonstrate the characteristics of normal speech and language
2. administer tests for speech and language assessment
3. perform various techniques of teaching language
4. examine and explain the process of speech development among children with special needs
5. teach speech and language to children with special needs

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	L	L	M	M	L	L		M		L	L	L	L
CO 2	M	L	L	L	M	L	L	L	L	L	L	L	L	L
CO 3	M	L	M	L	M	L	L	L	L	L	L	L	L	L
CO 4	M	M	L	L	L	L	L		L	L	L	L	L	L
CO 5	L	L	M	M	M	L	L	L	L	L	L	L	L	L

Orientation and Mobility- Practicum

Semester IV   Hours of Instruction / week   :   3
21BSEC12   No. of credits   :   2
Course Objectives
To enable students to:
1. describe the concept of O & M and explain history and evolution of O & M
2. demonstrate blindfold exercises
3. demonstrate safety technique
4. demonstrate sighted guide techniques
5. demonstrate long cane techniques

Unit 1: Introduction to Orientation & Mobility
Definition of the term: ' Orientation'- ' Mobility' - Blind fold Exercises: Auditory: Sound Localization – Discrimination - Masking Sound - Echo Location - Sound Shadow - Tactile Exploration of Surfaces: Identification of Clues and Landmarks in indoor and outdoor environment and its uses for mobility - use of kinesthesis - History and evolution of Orientation and Mobility   **9**

Unit 2: Safety Techniques (Simulation Mode)
Trailing - Protective Techniques (Upper arm, Lower arm and Both arms Techniques) - Squaring off - Techniques for Locating and picking dropped objects/articles: Circular, Perpendicular, Aero plane   **9**

Unit 3: Sighted Guide/Human Guide Techniques (Simulation Mode)
Familiarization with the Technique: Grip, stance, hand-position, speed-control - Getting started - Changing sides - Walking through narrow spaces and door-ways- Ascending and descending stairs - Getting into cars and public transport -Negotiating various seating arrangements   **9**

Unit 4: Use of Long Cane (Simulation Mode)
Use of cane techniques - Grip, Rhythm, Swing, Gait, Arc, Taking Direction using Cane   **9**

Unit 5: Use of Long Cane Techniques (Simulation Mode)

Two -point touch technique- Three point touch technique- Trailing with cane- Ascending and descending stairs with cane- Prepare a tactile route map   **9**

Total Hours :   45

Text Books:
1. Mani, M.N.G.(2006), Braille - Instructions for Teacher Preparation in Tamil Nadu. Coimbatore. Ramakrishna Mission Vidyalaya Press.
2. Punani, B and Rawal, N, (1993), Visual Handicap: Hand Book. New Delhi. Ashish Publishing House.
3. Vijayan, P. & Victoria, N.G. (2009). Teaching Orientation and Mobility Skills to Persons with Visual Impairment. Coimbatore. Saradalaya Press.

Reference books:
1. Fazzi, D. & Peters Meyer, B. (2001) Imagining the Possibilities: Creative Approaches to Orientation & Mobility Instruction for Persons Who Are Visually Impaired. New York, American Foundation for the Blind (AFB) Press.
2. Hill, E. & Ponder, P. (1976). Orientation and Mobility Techniques: A Guide for the Practitioner. New York: American Foundation for the Blind.
3. Jacobson, W. H. (1993) The Art and Science of Teaching Orientation & Mobility to Persons with Visual Impairments. New York: American Foundation for the Blind.
4. Knott, N.I. (2002). Teaching orientation and mobility in the schools: An instructor's companion. New York: American Foundation for the Blind Press.
5. LaGrow &Weessies (1994). Orientation and Mobility: Techniques for Independence Dunmore Press Limited.

Course Outcomes:
On completion of the course the student will be able to
1. discuss the concept and history and evolution of O & M for persons with visual impairment
2. demonstrate safety techniques in simulation
3. perform various techniques in simulation involving sighted as guide
4. learn to proper use of cane in simulation
5. perform long cane techniques in simulation mode for mobility

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1		L		H		L	H	M		H	L	L	L	M
CO 2		M		L		H	M	L		H	L			M
CO 3		M		M		L	M	L		H	L			M
CO 4		L		L		H	L	M		H	L	L		H
CO 5		L		L		H	L	M		H	L	L		H

Special Functions and Fourier Series

Semester IV   **Hrs of Instruction/week : 5**
21BSMC10   **No. of Credits: 3**

Course objectives:

1. To familiarize the concepts of Special functions and Fourier Series.
2. To know the relationship between Beta and Gamma functions.
3. To derive Fourier series of a given periodic function.

Unit 1

The Gamma function: Definition - Recurrence formula for $\Gamma(n)$ - Relation between gamma functions and factorials - value of $\Gamma(\frac{1}{2})$. **15**
The Beta function: Properties of Beta Functions-Other forms of Beta functions - Relation between Beta and Gamma functions.

Unit 2

                                                                                15

Application of Gamma and Beta functions: Evaluation of integrals.

Unit 3

Bessel functions: Definition-Series solution of Bessel's equation - Bessel function of   **15**
the first kind of order n, $J_n(x)$ - The zeros of the Bessel functions-Expansions for $J_0(x)$
and $J_1(x)$-Values of $J_{1/2}(x)$ and $J_{-1/2}(x)$.

Unit 4
Properties of Bessel functions: Recurrence formula for Bessel functions - Bessel's   **15**
coefficients- Bessel's integral for $J_n(x)$.

Unit 5
Fourier series: Definition - Finding Fourier coefficients for a given periodic function   **15**
with period 2Π, odd and even functions - Half range Fourier series.

                                                           Total Hours   75

Text Books:

1. *P. Kandasamy and K. Thilagavathi(2004),* ***"Mathematics for B.Sc, Branch – 1, second semester volume II"***, S. Chand and Company Ltd. (Units I & II)
2. *M. K. Venkataraman* (2006), ***"Higher Mathematics for Engineering and Science"***, The National Publishing Company. (Units III & IV)
3. *S. Narayanan, T. K. Manicavachagom Pillay (2006),* ***"Calculus, Volume- III Differential equations & Fourier series &Fourier Transforms",***S. Viswanathan (Publishers & Printers) Pvt., Ltd., Chennai. (Unit V)

Reference Books:

1. Z.X. Wang & D.R.Guo (1989),**"Special Functions",** World Scientific Publications.
2. Robert T.Seeley (2006), "**An Introduction to Fourier Series and Integrals**", Dover Publications, Inc. Mineola, New York.

Course Outcomes:

 On completion of the course, the students will be able
to

1. Understand the basic concepts of Beta and Gamma functions
2. Use the Beta and Gamma functions to evaluate integrals.
3. Apply Bessel functions in Physics and Engineering.
4. Establish Bessel integrals for Bessel coefficients occurring in Astronomy problems.
5. Express periodic function as a Fourier
    series.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	M	H	M	M	M	M	L	M		L	H	M	
CO 2														
CO 3	H	M	L	M	M	M	L	M	M		L	M	L	
CO 4	M	M	L	M	M	M	L	M	M		L	M	M	
CO 5	L	M	M	M	L	M	L	L	M	L	M	M	L	

Dynamics

Semester IV **Hrs of Instruction/week: 5**
21BSMC11 **No. of Credits: 3**

Course objectives:

1. To understand the concepts of Projectile and Central Forces.
2. To learn impulsive forces and collision of elastic bodies.
3. To familiarize the concept of SHM and moment of inertia.

Unit 1

Projectiles: Definitions - path of a projectile - characteristics of the motion of a projectile - maximum horizontal range - velocity of a projectile at the end of time t - range on an inclined plane - greatest distance on an inclined plane - problems. **15**

Unit 2

Impulsive forces: Impulsive force - impact of two bodies - loss of kinetic energy - problems.
15
Collision of elastic bodies: Definitions - fundamental laws of impact - impact of a smooth sphere on a fixed smooth plane - direct and oblique impact of two smooth spheres - loss of kinetic energy - problems.

Unit 3

Simple Harmonic Motion: SHM in a straight line - general solution - geometrical representation - change of origin - composition of two SHMs of the same period in the **15** same straight line - composition of two SHMs of the same period in two perpendicular directions - problems.

Unit 4

Motion under action of central forces: Introduction - velocity and acceleration in polar coordinates - equations of motion in polar coordinates - the equiangular spiral - **15** motion under a central force - differential equation of central orbits - pedal equations - velocities in a central orbit - law of force - law of the inverse square - problems.

Unit 5

Moment of Inertia: Definition - the theorem of parallel axes - the theorem of **15** perpendicular axes - moments of inertia - problems.

Total Hours **75**

Text Book:

1. *M. K. Venkataraman (2001). "A Text Book of Dynamics"*, Agasthiar Publications, 10th edition.

Reference Book:

1. *P. Duraipandian, Laxmi Duraipandian and Muthamizh Jayapragasam (2007). "Mechanics"*, S.Chand & Company Ltd., New Delhi.

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

1. Derive the characteristics of the motion of a projectile.
2. Analyse the problems involving impulsive forces.
3. Construct mathematical equations for Simple Harmonic Motion.
4. Illustrate the motion under action of central forces.
5. Determine the moments of inertia of simple geometric shapes.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	H		M	M	M	L				L	H	M	
CO 2	H	H		H	M	M	L	M			M	H	M	
CO 3	M	H	M	L		M	H	L	M		M	H	M	L
CO 4	M	H	M	L		M	H	L	M		M	H	M	L
CO 5	M	H	M	M	L	M	H		M		M	H	M	L

Numerical Methods

Semester IV   **Hrs of Instructions/week: 4**
21BSMC12   **No. of Credits: 3**

Course objectives:
1. To learn the methods of finding roots for Algebraic and transcendental equations.
2. To learn Numerical methods for solving mathematical problems.
3. To study various numerical methods for differentiation and integration.

Unit 1

Solution of Algebraic and Transcendental equations: Bisection method, The method of false position, Iteration method, Acceleration of convergence: Aitken's Process, Newton–Raphson Method, Generalized Newton's method, Ramanujan's method, Graeffe's root squaring method. **12**

Unit 2

Interpolation: Finite Differences: Forward differences, Backward differences, Central differences, Symbolic relations and separation of symbols, Newton's forward and backward formulae for interpolation. Central difference interpolation formulae: Gauss's central difference formula, Stirling's formula, Bessel's formula, Everett's formula, interpolation with unevenly spaced points: Lagrange's interpolation formula, Divided differences, Newton's general interpolation formula. **12**

Unit 3

Numerical Differentiation and Integration: Numerical differentiation, Derivatives through Newton's forward difference formula, Newton's backward difference formula, Maximum and minimum values of a tabulated function. Numerical Integration**:** General integration formula, The Trapezoidal rule, Simpson's ⅓ rule, Simpson's ⅜ rule. **12**

Unit 4

Linear Systems of Equations: Solution of linear systems, Direct Methods: Matrix Inversion Method, Gauss elimination method, Modification of Gauss method, Gauss Jordan method. Solution of linear systems, Iterative Methods: Gauss Jacobi method and Gauss Seidel method. **12**

Unit 5

Numerical solution of Ordinary Differential Equations - Taylor-series method, Euler and Modified Euler methods, Runge-kutta methods. **12**

Total Hours 60

Text Book:
1. *S.S.Sastry(2009)."Introductory methods of Numerical Analysis",* Prentice- Hall of India Learning Private Ltd., 4thEdition, New Delhi.

Reference Books:

1. *M. K. Venkataraman (1995). "Numerical methods in Science and Engineering",* The National Publishing Company, Madras.
2. *Curtis F. Gerald and Patrick.O. Wheatley (1984)."Applied Numerical Analysis",* Addison-Wesley Publishing Company – 3rd edition.

Course Outcomes:

On completion of the course, the students will be able to

1. Find the solution for algebraic and transcendental equation.
2. Apply the knowledge of interpolation in analyzing the data.
3. Calculate numerical differentiation of data and functions.
4. Select appropriate numerical methods and apply them in various types of Engineering
   fields.
5. Solve ordinary differential equations using Taylor-series method

CO /PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO1	PSO2	PSO 3
CO 1	H	M	L	H	H	M	M	L	M	L	H	M	M	M
CO 2	M	H	M	H	H	H	M	H	H	L	H	H	M	M
CO 3	M	H	H	M	H	M	H	M	M	L	H	M	M	M
CO 4	H	H	H	H	H	H	H	H	H	M	H	H	H	H
CO 5	H	H	H	M	M	H	H	M	H	M	H	H	H	H

(For Special Education Major)

Semester IV   **Hours of Instructions/week: 4**
21BSEI05   **No. of Credits: 3**

Course Objectives:
1. To acquire the knowledge on probability distribution.
2. To learn the concept of estimation and method of estimation.
3. To understand the procedures of test of significance.

Unit 1

Binomial Distribution: Definition of Binomial distribution - Derivation of Mean - **12**
Mode - Variance - Moment Generating Function - Cumulant Generating Function -
Additive property - Recurrence relation for Central moments - Simple problems.

Unit 2

Poisson Distribution: Definition of Poisson distribution - Derivation of Mean - Mode **12**
- Variance - Moment Generating Function - Cumulant Generating Function - Additive
property - Recurrence relation for Central moments - Simple problems.

Unit 3

                                                                              12

Normal Distribution: Definition of Normal distribution - Derivation of Mean - Median
Mode - Moment Generating Function and Cumulant Generating Function - Additi
property - Area Property.

Unit 4

Estimation Theory: Definitions of Estimator - Consistency - Unbiasedness - Efficiency **12**
Sufficiency. Statements of Neyman's factorization Theorem - Rao-Blackwell theore
Method of maximum likelihood - Simple Problems.

Unit 5

Test of Significance: Procedure for test of significance - Test of significance for single **12**
mean with small and large samples - Test of significance for difference of means with

small and large samples - χ^2 - Test for Independence of Attributes - F- test for equality
of two population variances.

Total Hours :   **60**

Text Books:
1. *S. C. Gupta and V. K. Kapoor (2002).* ***"Fundamentals of Mathematical Statistics - Volume
   I",*** *Sultan Chand and Sons, New Delhi.*

2. G. Arulmozhi and S. Muthulakshmi (2009). *"Statistics for Management"*, Tata Mc Graw Hill & Company, New Delhi.

Reference Books:

1. *S. M. Ross (2003).* ***"Introduction to Probability Models"***, *6th edition, Academic Press.*
2. *T Veerarajan (2003).* ***"Probability, Statistics and Random Processes"***, *2nd edition, Tata Mc Graw Hill & Company, New Delhi.*
3. *N. Subramanian (2005).* ***"Random Process"***, *Sem Publishers.*

Course Outcomes:

On completion of the course, the student will be able to

1. Acquire a broad knowledge of binomial distributions.
2. Derive moment generating function and characteristics function of poisson distributions.
3. Analyze properties of normal distribution.
4. Understand methods of estimation.
5. Apply tests of significance to real world situations.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	M	M				H	M	M	H		H	M	M	M
CO 2	M	H			M	H	M	M	H		H	H	M	M
CO 3	M	H	M	M	M	H	M	M	H	M	H	H	M	H
CO 4	M	M				L	M	M	H		H	M	M	L
CO 5	M	H	M	M	H	H	M	M	H	M	H	H	M	H

Identification and Assessment of Intellectual Disability

Semester V   **Hours of Instruction / Week : 5**
21BSEC13   **No. of credits   : 3**

Course Objectives:
To enable the students to
1. classify intellectual disability in medical, psychological and educational perspectives
2. demonstrate knowledge on early identification and intervention of intellectual disability
3. state the educational and vocational programmes for intellectual disability

Unit 1 Concept of Intellectual Disability

Definition and classification – medical, psychological and educational classification, Incidence and prevalence of intellectual disability, types and degrees of intellectual disability, Causes & prevention and Associated conditions commonly seen in intellectual disability   **15**

Unit 2 Characteristics and Behavioural Management

Psychological and behavioural characteristics, Adaptive behaviour during various stages of development. Methods in managing behaviours, Identifying and analyzing problem behaviours and behavioural management.   **15**

Unit 3 Early Identification and Intervention

Early Screening and Assessment, Early Intervention Assessment Checklists- Upanayan. Prenatal and neonatal screening methods, Psychological and psycho-educational assessment, psycho-educational assessment tools-MDPS, FACP, BASIC-MR – Task analysis, Shaping, Chaining, Prompting and Reinforcement   **15**

Unit 4 Curricular Intervention

Curriculum planning for Children with Intellectual Disability- Principles of curriculum construction, Flexibility in curriculum planning, Individualized Education Plan, Approaches to curriculum in teaching - Ecological approach, Multi sensory approach, Diagnostic prescriptive teaching, Computer Assisted Instruction. Classroom organization and adaptations, material preparation and teaching practice – lesson plans and group teaching, Co-curricular activities for the intellectually disabled – Yoga, Music, Dance, Art and Craft, Drawing Games and Sports.   **15**

Unit 5 Educational and Vocational Programmes

Service models in various settings – Residential day care, special classes in normal school, resource room, Roles and responsibilities of resource teacher and Special teacher. SSA and Inclusive education. Need for Pre- vocational skill development, Concept of sheltered workshops, Transitory employment centers, multi-category training centers, Legislative measures pertaining to employment. Individual Vocational Plan(IVP), Skills for Adult living and sexuality training.   **15**

Text Books :
1. Ashok. C. A, (2006). Principles of Management on Employment of Persons with Mental Retardation. New Delhi: Kanishka Publishers.
2. Myreddi, V. & Narayan, J. (2000). Functional Academics for Students with Mental Retardation. Secunderabad.: NIMH.
3. Pandey. V. P (2004). Mental Retardation and Social Responsibility. New Delhi: Sumit Enterprises.

Reference Books:
1. Basch, J. (2020). Half A Brain: Confessions of A Special Needs
2. Brown, I. & Percy, M. (2007). A Comprehensive Guide to Intellectual and Developmental Disabilities, Brookes Publishing.
3. Brue, A. & Wilmshurst, L. (2016). Essentials of Intellectual Disability Assessment and Identification, Wiley.
4. Harris, J. C. (2005). Intellectual Disability, OUP USA.

Course Outcomes:
On completion of the course the student will be able to
1. differentiate intellectual disability in medical, psychological and educational perspectives
2. describe the characteristics of intellectual disability and apply behavior management –
3. administer appropriate tools for early identification of intellectual disability
4. construct curriculum for children with intellectual disability
5. refer children with intellectual disability to suitable educational and vocational programmes.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO1	PSO 2	PSO 3
CO 1	L	L	H	L	L	L	L	L		L		M	L	L
CO 2	M	H	M	L	L	L	L	L	L	L	L	L	M	M
CO 3	H	H	M	H	H	M	M	L		L		L	M	H
CO 4	L	L	M	H	H	H	M	M	M		M	L	H	H
CO 5	L	L	L	H	M	H	H	M	H	H	H	L	M	H

Introduction to Multiple Disabilities

Semester V   **Hours of Instruction / week: 5**
21BSEC14   **No. of credits   : 3**

Course Objectives:
To enable the students to:
1. describe the concept of Multiple Disabilities and its causes
2. explain the types of concomitant impairments and implications
3. define deaf blindness and explain teaching methods for communication

Unit 1 Introduction to Multiple Disabilities

Concept and definition of Multiple Disabilities, Developmental stages- Physical, social, cognitive, language and emotional, Developmental delays and their implications in the life cycle. Causes and types of Multiple Disabilities   **15**

Unit 2 Children with Hearing Impairment and Additional Disabilities

Concept and definition. Types of additional disabilities, Current status of education of hearing impaired child with additional disabilities, Challenges of teaching hearing impaired child with additional disabilities, Early intervention and its significance in education of hearing impaired with additional disabilities.   **15**

Unit 3 Children with Visual Impairment and Additional Disabilities

Concept and definition. Types of additional disabilities and assessment. Current status of education of visually impaired child with additional disabilities. Challenges of teaching visually impaired child with additional disabilities. Early detection, intervention - its significance in education of visually impaired with additional disabilities.   **15**

Unit 4 Children with Deaf blindness

Assessment – hearing, vision and age of onset, Teaching communication skills – verbal and non-verbal. Using vibratory devices for communication. TADOMA Method, Braille and Large Print. Manual alphabet and Total Communication.   **15**

Unit 5 Children with Cognitive Deficits, Neuromuscular and Locomotor Disabilities

Intellectual Disability, Learning disability, ADHD and Autism– concept and educational implications. Cognitive deficits and cerebral palsy – concept and educational implications, Cognitive deficits in children and polio mellitus – concept and educational implications, Cognitive deficits children and epilepsy – concept and educational implications , Architectural modifications and Special aids and equipment   **15**

                                                        Total Hours **75**

Text Books:
1. Reddy .G. L. and Kusuma. M. (2000). Education of Children with Special Needs. New Delhi. Discovery Publishers.

2. Venkatesan, S. (2003), Children with Developmental Disabilities: A Training Guide for Parents, Teachers and Caregivers, New Delhi. Sage Publications.
3. Vijayan P. and Naomi V. G., (2005), Handbook: Education of Visually Impaired Children with Additional Disabilities. New Delhi. Rehabilitation Council of India.

References Books:
1. Aggarwal, K. (2002). Handbook for Parents of Children with Disabilities. Planning Commission. Govt. of India.
2. Biwas, P.C (2004). Education of Children with Visual Impairment in Inclusive Education. New Delhi: Abhijeet Publication.
3. Bobalg, O. (2006). Teaching Students with Mental, Physical and Multiple Disabilities. New Delhi: Corwin Press.
4. Hegarty, S. & Alur.M. (2002). Education and Children with Special Needs: From Segregation to Inclusion. New Delhi, Sate.
5. Reddy. G. L. (2004). Mental Retardation: Education and Rehabilitation Service. New Delhi: Discovery Publishing House.
6. Roger. P (2008). Teaching Students with Autism Spectrum Disorders. New Delhi: Corwin Press.

Course Outcomes:
On completion of the course the student will be able to
1. state the concept of Multiple Disabilities
2. classify types of concomitant with additional disabilities
3. summarize the challenges faced by different categories of Multiple Disabilities
4. specify Deaf blindness and demonstrate the communication mode for Deaf Blindness
5. discuss the challenges in teaching children with Multiple Disabilities

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	M	M	M	L	L	M	M	H	M	H	H	H	H
CO 2	H	M	H	H	M	L	M	H	H	M	H	H	M	H
CO 3	L	L	H	H	H	H	H	H	H	H	H	H	H	H
CO 4	M	L	M	L	L	M	H	H	H	M	M	H	H	H
CO 5	L	L	H	H	H	H	H	H	H	H	H	H	H	H

Assessment and Training of Intellectual Disability – Practicum

Semester V   **Hours of Instruction / week : 5**
21BSEC15   **No. of credits   : 2**

Course Objectives:
To enable the students to:
1. screen children with Intellectual disability
2. prepare case study and write report
3. plan and implement Individual Educational Plan using the appropriate teaching aids

Unit 1 Screening

Screening of Children with Intellectual Disability using Screening Checklist developed by the National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID) screening schedule in the community, visit special schools, observation, preparation of check list for screening   **15**

Unit 2 Preparation of Assessment Kit

Preparation of Assessment Kit for Children with Intellectual Disability – Madras Developmental Programming System (MDPS), Functional Assessment Checklist for Programming (FACP) and Behavioural Assessment Scale for Indian Children with Mental Retardation (BASIC MR)   **15**

Unit 3 Assessment of Children with Intellectual Disability

Psycho-educational assessment- Madras Developmental Programming System (MDPS), Functional Assessment Checklist for Programming (FACP) and Behavioural Assessment Scale for Indian Children with Mental Retardation (BASIC MR), IQ assessment –Behavioural analysis – ABC ANALYSIS – behavioral recording, intervention and evaluation and Preparation of case study   **15**

Unit 4 Planning Intervention and Evaluation

Planning IEP, setting goals and objectives, Lesson plan and individual and group teaching and preparation of relevant TLM and preparation of Teaching Aids. Intervention and evaluation, Co- curricular activities for the intellectually disabled.   **15**

Unit 5 Documentation

Preparing case studies, individual and group teaching record, Art and Craft record,   **15**
documentation of co-curricular activities, and reporting

| | **Total Hours :** | **75** |

Text Books:
1. Bhaskara Rao, D. &N.V.M. Mohana Rao. (2002). Problems of Mentally Handicapped Children. New Delhi. Discovery Publishing House.
2. Myreddi, V. & Narayan, J. (2000). Functional Academics for Students with Mental Retardation. Secunderabad.: NIMH.
3. Fox, A.M. (2003). *Neuro-Developmental Disorders*. New Delhi: National Trust.

Reference books:
1. Ashok. C. A, (2006). Principles of Management on Employment of Persons with Mental Retardation, New Delhi. Kanishka Publishers.
2. Bhawna. M (2002). Educating the Mentally Disabled, New Delhi, Mohit Publications.
3. Pandey. V. P (2004). Mental Retardation and Social Responsibility. New Delhi, Sumit Enterprises.
4. Reddy. G. L. (2004). Mental Retardation: Education and Rehabilitation Service. New Delhi. Discovery Publishing House.
5. Roger. P (2008). Teaching Students with Autism Spectrum Disorders. New Delhi. Corwin Press.

Course Outcomes:
On completion of the course the student will be able to
1. screen, identify and assess children with Intellectual Disability in the community
2. apply behaviour modification techniques and the investigative procedure.
3. prepare IEP and Intervention strategies for children with Intellectual Disability
4. apply the psycho educational assessment using kit developed
5. prepare and present case study report

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO1	PSO 2	PSO 3
CO 1	H	M	M	L	H	L	L	L	L	L		L	M	L
CO 2	M	M	L	H	H	L	L	M	L	L		M	L	L
CO 3	M	M	H	M	H	H	H	H	M	L	L	M		M
CO 4	L	L	M	M	H	H	H	M	M	H	M	L	M	
CO 5	M	M	L	M	H	H	M	L	M	L	L	L		H

Assistive Technology for Persons with Disabilities
(Self Study)

Semester V : 1

Hours of Instruction / week

21BSEC16

No. of credits : 4

Course Objectives:
To enable the students to:

1. explain the concept of Assistive Technology and its significance for education and rehabilitation of Persons with Disabilities
2. account different Assistive Technology useful for Persons with Disabilities
3. select appropriate Assistive Technology to different categories of Persons with Disabilities

Unit 1 Assistive Technology for the Visually Impaired

Assistive Technology: Concept, Importance and Role, Different types of assistive technology for Communication, Mobility, Environmental control, Activities of daily living and Education **3**

Unit 2 Assistive Devices for Children with Hearing Loss

Importance of Assistive Devices for Assessment and Identification of People with Hearing Loss, Types of Assistive Technology for educational purposes, Amplified Handsets. Cochlear implants. Computer Assisted Note taking. **3**

Unit 3 Assistive Technology for Specific Learning Disabilities

Assistive Technology: Concept, Importance and Role, Assessment and Identification of the Needs, Types of Assistive Technology for specific learning needs: organization, reading, writing, mathematics, language. Benefits and limitations of using assistive devices, Information and Communication Technology for individuals with learning disabilities **3**

Unit 4: Assistive Technology for the Intellectually Disabled and Autism

Importance of Assistive Devices for Intellectual Disabilities, Different types of assistive technology for Communication, Mobility, Environmental control and Education, Assistive technology for Autism, Assistive Technology for Communication Skills, Social and Daily living Skills **3**

Unit 5: Universal Design for Learning(UDL) and Assistive Technology

Universal Design- Evolution, UDL- Components and Principles, Integrating AT in UDL, Assessment of needs to identify the appropriate assistive technology, Selection & use of appropriate Assistive Technology **3**

Total Hours 15

Text Books:

1. Agarwal. J.C. & Gupta. S. (2007). Elementary Educational Technology. New Delhi. Shipra Publications.
2. CBM India Trust (2017) Assistive Devices and Technology – Products for Persons with Disabilities, Coimbatore, SKROLL - EDP
3. Raskind, M. H. (2000). Assistive Technology for Children with Learning Disabilities. Bridges to Reading (2nd Ed.). Schwab Foundation for Learning. San Mateo, CA.

Reference Books:
1. Andersson,C. (2014).Assistive Technology for the Hearing Impaired, Deaf and Deafblind. New Delhi. Amazon Pub.
2. Mathew,S.M. (2012).Technology for Persons with Hearing Impairment. Status of Disability in India-2012. New Delhi: RCI
3. Proceedings: Asian Conference on Adaptive Technologies for the Visually Impaired (2009). New Delhi: Asian Blind Union
4. Reddy .G. L. and Kusuma. M. (2000). Education of Children with Special Needs. New Delhi. Discovery Publishers.
5. Singh, J.P. (2003). Technology for the Blind-- Concept and Context. New Delhi: Kanishka Publications.

Course Outcomes:
On completion of the course the student will be able to
1. explain the importance of Assistive Devices for Independent Living
2. describe the use of Assistive Technology for educational purposes
3. predict Assistive Technology for rehabilitational purposes
4. figure out the Assistive Technology for communication
5. integrate Assistive Technology in UDL

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1				L	L	H	M	L	M			L	M	H
CO 2	L	L	M	L	M	H	M	L	M			L	M	H
CO 3	L	L	M	L	M	H	M	L	M			L	M	H
CO 4	L	L	M	L	M	H	M	L	H	L	L	L	M	H
CO 5	L	L	M	L	M	H	M	L	H	L	L	L	M	H

Abstract Algebra – I

Semester V   **Hrs of Instruction/week: 5**
21BSMC13   **No. of Credits: 3**

Course objectives:
1. To develop abstract thinking.
2. To learn the concept of homomorphism in groups and rings.
3. To understand the properties of ideals in rings.

Unit 1

Subgroups: Subgroups - definitions - Examples - Cosets - Lagrange's theorem - Applications of Lagrange's theorem - Counting principle.   **15**

Unit 2

Normal Subgroups: Normal Subgroups - Characterizations of normal subgroups - Quotient Groups - Order of Quotient Groups - Homomorphisms - Kernel of **15** homomorphism - Fundamental theorem of homomorphisms - Cauchy's theorem and Sylow's theorem for Abelian groups(Statement only).

Unit 3

Automorphisms: Automorphisms - Group Structure of automorphisms - Inner **15** automorphisms with examples -Cayley's theorem.

Unit 4

                                                                              15

Rings and Homomorphisms: Ring - Definition and Examples - Integral domains - Division rings - Fields - Ring of integers -mod p-J_p - Finite characteristic - Homomorphisms of rings -Kernel of a ring homomorphism -Isomorphism of rings.

Unit 5

                                                                              15

Ideals and Quotient rings: Ideals - Quotient rings - Maximal ideals - Characterization of maximal ideals -Field of quotients of an integral domain.

                                                      Total Hours   75

Text Book:
1. *N. Herstein (2007).“Topics in Algebra”,*John Wiley & sons, New York, Second Edition.

Reference Books:
1. *D.S.Dummit and Richard M.Foote (2004).“Abstract Algebra”*, Wiley India, Third Edition.
2. *VivekSahai and VikasBist (2008). “Algebra”*, Narosa Publishing House, New Delhi.

Course Outcomes:

On completion of the course, the students will be able to

1. Apply Lagrange's Theorem to analyze the cyclic subgroup of a group.

2. Explore the concepts of homomorphism and isomorphism for groups.

3. Develop group structures of Automorphism.

4. Analyse the properties of rings and ring homomorphisms.

5. Demonstrate examples for ideals and quotient rings.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	M	M				M	M	H	H		H	L	H	M
CO 2	M	M					M	H	H		H	M	L	H
CO 3	M	M					M	H	H		H	M	L	H
CO 4	H	H	M		M		M	M	M		H	H	M	M
CO 5	H	H	M		M		M	M	M		H	H	M	L

Real Analysis –I

Semester V   **Hrs of Instruction/week: 5**

21BSMC14   **No. of Credits: 3**

Course objectives:
1. To understand the fundamental concepts of Real Number System.
2. To know about the Euclidean Space R^n.
3. To learn the concepts of Limits, Continuity and Compactness.

Unit 1

Some Basic Notions of Set Theory: Upper bounds, maximum element, least upper bound – The Completeness axiom – Some properties of the supremum – Properties of the integers – The Archimedean property – Rational numbers with finite decimal representation – Finite and Infinite decimal representation of real numbers – Absolute values and the triangle inequality – The Cauchy- Schwarz inequality – Plus and minus infinity and the extended real number system R- Sequences - Similar (equinumerous) sets - Finite and infinite sets - Countable and uncountable sets - Uncountability of the real-number system -Set Algebra - Countable collections of countable sets.   **15**

Unit 2

   15

Elements of Point Set Topology: Euclidean space R^n - Open balls and open sets in R^n - The structure of open sets in R^1 - Closed sets - Adherent points - Accumulation points - Closed sets and adherent points.

Unit 3   **15**

Elements of Point Set Topology Continued: The Bolzano - Weierstrass theorem - The Cantor intersection theorem - The LindelÖf covering theorem- The Heine Borel covering theorem - Compactness in R^n .

Unit 4   **15**

Metric spaces: Point set topology in metric spaces – Compact subsets of a metric space- Boundary of a set.

Unit 5

Limits and Continuity: Convergent sequences in a metric space - Cauchy Sequences - Complete metric spaces - Limit of a function - Continuous functions - Continuity of composite functions - Examples of continuous functions.   **15**

Total Hours   75

Text Book:
1. *T.M. Apostol (2002)*, ***"Mathematical Analysis"***, Second Edition, Narosa publishing house, Twentieth Reprint.

Reference Book:

1. Richard R. Goldberg (1970), "**Methods of Real Analysis**", Oxford & IBH publishing CO. Pvt. Ltd., New Delhi.

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

1. Recognize the basic properties of Real Number System.
2. Identify closed and open sets in Euclidean Space.
3. Prove standard theorems in Real Analysis.
4. Understand the concept of compactness and metric spaces.
5. Acquire abstract and logical thinking that pervades modern analysis.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	M		M	M	M	H	M	M	L	H	H	M	M
CO 2	H	H	L	M	H	M	H	M	H	M	M	H	H	L
CO 3	M	M	L	H	H	H	M	H	H	M	M	H	H	M
CO 4	M	M		M	H	H	H	M	H	M	H	H	H	M
CO 5	H	H	M	H	M	H	M	H	H	M	M	H	H	H

Complex Analysis – I

Semester V   **Hrs of Instruction/Week: 5**
21BSMC15   **No. of Credits: 3**

Course objectives:
1. To understand the concepts of analytic functions, entire functions and harmonic functions.
2. To learn the concepts of elementary transformations.
3. To acquire knowledge about complex integration.

Unit 1

Introduction: Complex Numbers – Set of Complex points – Complex Functions - Limits and Continuity of a function - Differentiation of a function - Differentiability at a point - Necessary conditions for differentiability. **15**

Cauchy Rieman Equations: Cauchy-Riemann equations - Derivative of f(z) in different forms - C-R equations in polar form - Sufficient conditions for differentiability - Examples.

Unit 2

Analytic functions: Analytic functions -Entire functions - Complex function as a function of z and $\bar{z}$ - Properties of an analytic function. **15**

Unit 3

15

Harmonic functions: Harmonic function in polar co-ordinates - Construction of an analytic function - Examples**.**

Unit 4

Mappings: Mappings - Bilinear transformation - Component transformations of a bilinear transformation - Finding a bilinear transformation - Examples. **15**

Unit 5 Complex integration

15

Complex integration: Complex integral along a curve -Cauchy's theorem - Cauchy's integral formula - Cauchy's integral formulas for derivatives -Morera's theorem - Examples.

Total Hours   75

Text Book:
1. *P.Duraipandian   and   K.Pachaiyappa   (2009).   "Complex   Analysis",* Muhil Publishers.

Reference Books:

1. *S. Arumugam, A. Thangapandi Isaac & A. Somasundaram (2004). "Complex Analysis",* Scitech Publications, India, Pvt., Ltd.
2. *J.N. Sharma (1991). "Functions of a complex variable",* Krishna Prakashan Media.

Course Outcomes:

On completion of the course, the students will be able to

1. Operate complex derivatives of a function.
2. Determine analyticity of a function using C-R equations.
3. Construct analytic functions.
4. Analyze Bilinear transformations.
5. Apply Cauchy's theorem and Cauchy's integral formula to evaluate integrals.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	M		H		M		M			M	H	L	
CO 2	H	M		H	L	M	M	M			M	H	L	
CO 3	H	M		H	L	M	M	M			M	H	L	
CO 4	H		L	M		L	M	M	M		M	H	M	
CO 5	M	H	H	L	M			M	M		H	H	M	

Discrete Mathematics

Semester V	**Hrs of Instruction/week: 3**
21BSMC16	**No. of Credits: 3**

Course objectives:

1. To understand the mathematical logic.
2. To learn the basic concepts of Ordered Relations and Structures.
3. To know about Lattice and its types.

Unit 1

Mathematical Logic - Introduction **-** Statement and Notation - Connectives - Statement **9**
formulae - The truth table of a Statement formula - Well formed formulae.

Unit 2 **9**

Mathematical Logic Continued - Tautology –Equivalence of formulae– Law of
Duality–Tautological Implications.

9

Unit 3

Normal Forms - Formulas containing n variables – Functionally complete sets of
connectives - Normal forms.

Unit 4

9

Ordered Relations and Structures: Partially ordered relations - Hasse diagram -
Maximal member - Minimal member - Greatest member - Least member - Greatest
lower bound - Least upper bound.

Unit 5

9

Lattices: Join - Meet - Principle of duality - Lattice as algebraic system - Some Special
lattices.

Total Hours 45

Text Book:

1. *G. S. S. Bhishma Rao (2009). **"Discrete Structures and Graph Theory"**,* SCITECH
   Publication Pvt., Ltd., Chennai.

Reference Book:

1. J.P.Tremblay, R.Manohar(1999), "Discrete Mathematical Structures with Applications to
Computer Science", Mc Graw Hill Education.

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

1. Determine the truth value of statements.
2. Find tautology and equivalence formula
3. Identify the normal forms
4. Construct Hasse diagram for a given set with relation.
5. Apply the concept of lattice in Boolean Algebra.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H			M		H	M	M				H	L	
CO 2	H	H		M		M	H	M				H	M	
CO 3	H	H	M	L		M	H	M				H	M	
CO 4	H	H	M	M		M	M	H			L	H		M
CO 5	H	M	H	M		H	M	L			M	H	M	M

Community Based Rehabilitation

Semester VI
21BSEC18

Hours of Instruction / week : 3+2
No. of credits : 3

Objectives:
To enable the students to:
1. explain the concept of Community Based Rehabilitation
2. outline the organizational structure of Community Based Rehabilitation
3. acquire skills in the implementation of Community Based Rehabilitation Programme
4. employ economic rehabilitative activities
5. maintain CBR records for maintaining

Unit 1 Concept of Community Based Rehabilitation: Definition

Definition, Characteristics of Community Based Rehabilitation – criteria – Components of CBR – Services under CBR – Need for CBR – Historical background of CBR.

9+6

Unit 2 Organizational Structure and Roles- CBR Programme

Funding agency, National coordinating agency, Project Implementing Agency, Project coordinator, Special teachers, Project supervisor and Field workers.

9+6

Unit 3 Implementation Process: Selection of Project Area

Appointment of project implementing agency- Cluster formation - Selection of Field Staff – Training of Staff, Rehabilitation of Persons with Disabilities, hierarchy of CBR personnel

9+6

Unit 4 Economic Rehabilitation

9+6

Meaning of economic rehabilitation – Goal of economic rehabilitation– Mobilizing community resources – Role of field worker in economic rehabilitation –Role of parents and parent training – Facilities for economic rehabilitation – Case completion.

Unit 5 Monitoring CBR Project

Weekly review meetings – Attendance card – Monthly reports- Reporting formats – Case studies – Individual Rehabilitation Plan – Evaluation of CBR project.

9+6

Total Hours : 45+30

Practicum:
1. Visit the Community Based Rehabilitation Programmes
2. Observe the field workers meeting, weekly review meeting
3. Interaction with parents of disabilities
4. Preparing a IEP
5. Creating Barrier Free Environment in the community

Text Books:
1. Bhushan, N.S.(2017).Essentials of Community Based Rehabilitation. New Delhi: Jaypee Publications.
2. Devapitchai, K.(2010).Action Plan for Community Based Rehabilitation (CBR) in India. Germany: VDM Verlag Publisher.
3. Pruthvish,S.(2006). Community Based Rehabilitation of Persons with Disabilities. New Delhi: JAYPEE Publications.

Reference Books:

1. Masuda, K. (2013). Community Based Rehabilitation (CBR) of the Persons with Disabilities. United States: Lambert Academic Publishing.
2. Narayanansamy. S., Kansara. J., Rangasayee. R., (2006). Family, Community and the Hearing Child. New Delhi. Kanishka Publishers.
3. Punani, B., Rawal, N.S., Sajit. J., (2004). Manual Community Based Rehabilitation (Visually Impaired). Ahmedabad. Blind People Association.
4. Rao , Indumathi (2002). Joyful inclusion. Bangalore. CBR Network, India.
5. Saini. J. S. (2005). Vocational and Technical Education for the Disabled. Chandigarh. Abishek Publishers.

Course Outcomes:
On completion of the course the student will be able to
1. categorize different aspects in the CBR Programme
2. specify roles of CBR personnel
3. review CBR Implementation Procedure
4. summarize the essential components in economic rehabilitation
5. review CBR report/records

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1		H		M			M	M	M	L	M	M		M
CO 2		M		M		L	H	H	M	L	L	L		M
CO 3		M					M	M	L	L	L	L		M
CO 4		M		L			M	M	L	L	L	L		M
CO 5		H		M			M	M	L	L	L			M

Management in Special Education and Rehabilitation

Semester VI   **Hours of Instruction / week : 4**
21BSEC19   **No. of credits   : 3**

Course Objectives:
To enable the students to:
1. define management principles and sketch the process of management
2. describe the management procedure in terms of human resource and finance
3. examine the central and state level agencies in empowering PWDs

Unit 1 Concept of Management in Special Education

Concept and Principles of Management, Theories and Approaches of Management, **12**
Difference between Management and Administration, Planning – Preschool, Special
School, Rehabilitation Programme. Management in Special Education.

Unit 2 Process of Management

Planning – Institutional planning, Communication, Delegation, Decision making, **12**
Controlling, Networking – Concept and Importance with special reference to Special
Education and Rehabilitation Programme.

Unit 3 Inspection and Supervision

Meaning, Function and Scope of inspection and supervision in special education **12**
Programme, Types and kind of supervision, Roles and Responsibilities of supervisors.

Unit 4 Human Resource and Financial Management in Special Education and Rehabilitation

Staff Selection, Performance appraisal system, Job satisfaction, Resource mobilization **12**
and allocation, Basic accounting and Preparation of budget. Registration of society,
Trust Act, NGOs, Parents organization, Stress management, Motivation, Management
in natural and man made calamities.

Unit 5 Central and State Level agencies in Empowering Person with Disabilities

Committee and Central executive committee – Roles and Responsibilities. Centrally **12**
funded Autonomous Bodies – Objectives and their functions, Ministry of Human
Resource Development, Department of School Education and Higher Education for the
Disabled – Objectives and their function.

Total Hours : 60

Text Books:
1. Agarwal. J.C. & Gupta. S. (2007). Elementary Educational Technology. New Delhi. Shipra Publications.
2. Headington (2003). Monitoring, Assessment, Recording Reporting & Accountability. 2ⁿᵈ -Ed. London: David Fulton Publishing

3. Mathur,S.P. (2001). Financial Administration and Management. India: The Indian Publication.

Reference Books:
1. Chalam, S. K. (2007). Introduction to Educational Planning & Management. New Delhi. Anmol Publications.
2. Lal, M, (2007). Essentials of Educational Technology. New Delhi. Anmol Publications Pvt. LTD.
3. Mani, M. N. G. (2000). Inclusive Education in India Context. IHRDC, Coimbatore. Sri Ramakrishna Mission Vidyalaya.
4. Mohanty.J. (2005). Educational Administration, Supervision and School Management. New Delhi. Deep & Deep Publications.
5. Prasasd . J. and Prakash. R. (2007). Education of the Handicapped Children. New Delhi. Kanishka Publishers.

Course Outcomes:
On completion of the course the student will be able to
1. describe the management principles in special education
2. organize the process involved in management of PwDs
3. carry out the roles of supervisor as a management strategy
4. demonstrate skills in financial management
5. examine the central and state level agencies in empowering PwDs

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	L	L	L	L	L	L	M	L	L	L	L	L	L	L
CO 2	M	L	M	M	L	L	H	L	L	M	L	M	L	L
CO 3	M	L	L	L	L		M	L	M	L	L	L	M	H
CO 4		L	L	L	L	L	L	M	L	L	L		L	L
CO 5	L	L	L	L	L	L	L	L	L	L	L		L	L

Individualized Educational Plan - Practicum

Semester VI   **Hours of Instruction / week: 5**
21BSEC20   **No. of Credits : 2**

Objectives:
To enable the students to:
1. demonstrate skills in assessment of children with various disabilities
2. develop skills in planning and implementing individualized educational programmes specify role of stakeholders in IEP
3. prepare and implement IEP for children with visual impairment and hearing impairment
4. prepare and implement IEP for children with intellectual disability, autism and learning disability

Unit 1: Introduction to IEP

Definition, Purpose, Objectives of IEP, Need for Individual Education Program (IEP), Individual Family Service Plan (IFSP) & Individual Transition Plan (ITP) and Stages.   **15**

Unit 2: Development of IEP& Therapeutic Intervention

Components of IEP, IEP development team, Process of IEP development, Development of goals: Long term, short term & specific objectives and Evaluation of Goals and Maintenance. Therapeutic Intervention – Physiotherapy, speech therapy, occupational therapy, dance, art, music and yoga therapy.   **15**

Unit 3: Role of Stakeholders

Classroom Teachers, School Administrators, Special Educators, Parents and Student with Special Needs (above 13 years)- IEP Meeting   **15**

Unit 4: Planning and Implementing IEP for Sensory Disabilities

15

Present Level of Academic achievement and Functional Performance (PLAFD), Modification and Accommodation required to participate in general education. Braille instruction/Large print for Students with Visual Impairment. Communication and Language needs for Students with Hearing Impairment. Plan, prepare and Implement IEP for Children with Visual Impairment and Hearing Impairment. Prepare case study reports.

Unit 5: Planning and Implementing IEP for Cognitive Disabilities

Present Level of Academic achievement and Functional Performance (PLAFD), Modification and Accommodation required to participate in general education. Placement and Transition Plan. Plan, Prepare and Implement IEP for Children with Intellectual Disability, Autism and Learning Disability. Prepare case study reports.   **15**

Total Hours :   75

Text Books:
1. Ashok. C. A, (2006). Principles of Management on Employment of Persons with Mental Retardation. New Delhi. Kanishka Publishers.
2. Basu, H & Nath, T. (2009), Use of Taylor Frame: A Trilingual (English, Hindi & Bengali) Visual Guide, Kolkata. Society for the Visually Handicapped.
3. Narayan J. (2002). Grade Level Assessment for Primary School Children. Secunderabad. NIMH.

Reference Books:
1. Mani, M.N.G.(2006), Braille – Instructions for Teacher Preparation in Tamil Nadu. Coimbatore. Ramakrishna Mission Vidyalaya Press.
2. Roger. P (2008). Teaching Students with Autism Spectrum Disorders. New Delhi. Corwin press.
3. Santhanam. T. (2008). Learning Disabilities and Remedial Programmes. New Delhi. Discovery Publishers.
4. Singh, J.P. (2007) Technology for the Blind -Concept and Context. New Delhi. Kanishka Publishers.
5. Varsha Gathoo (Ed.) (2006). Curricular Strategies and Adaptations for Children with Hearing Impairment. New Delhi. Kanishka Publishers.

Course Outcomes:
On completion of the course the student will be able to
1. demonstrate competency in preparing IEP for children with disabilities
2. administer therapeutic and counseling techniques
3. prepare individual case profile and report
4. preparation of teaching learning material for various disabilities
5. involve multi disciplinary team for therapeutic intervention for children with various disabilities.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	L	L	H	M	H	L	M	M	M	M	L	L	M	H
CO 2		M	L	L	L	L	M	M	M	L	M			H
CO 3	M	L	L	H	H		M	L	H	M	L		M	M
CO 4	M		H	L	M	M	L	M		M	L		M	H
CO 5	L	H		M			L	L	L	L	L	L	L	M

Introduction to Sign Language – Practicum

Semester VI   Hours of Instruction / week : 3
21BSEC21   No. of credits: 2

Course Objectives:
To enable the students to:
1. develop competence in use of sign language
2. acquire knowledge on primary sign
3. be familiar in basic concept of sign
4. develop the skill of interpretation in sign language

.
Unit 1 Orientation to Signs:

Concept of sign language, characteristics and features of sign language - one and two   **5**
handed alphabets.

Unit 2 Basic Signs:

Members of the family - house hold activities - fruits, vegetables – food - numbers (1   **9**
to 1 lakhs).

Unit 3 Primary Level Based Signs:

Body parts, Colours – festival – shapes – animals - time - birds - transport,   **9**
professional, months, days, place, religion.

Unit 4 Signs on Grammatical Markers:

                                                                                         11

Verbs, Tense, Adjectives, Preposition – WH question form.

Unit 5 Interpretation of Sign Language:

                                                                                         11

Interpretation of conversation, meeting, song and story.

                                                Total Hours :   45

Text Books:
1. Dash, N, (2003). Integrated Education for Children with Special Needs, New Delhi, Dominant Publishers.
2. Asmita, H, (2006). Language and Communication, New Delhi, Kanishka Publishers.
3. IHRDC Indian Sign Language Dictionary 2001.

References :
1. Holy Cross Service Society, (2002), Modes of communication for Hearing Impaired Video CD, version, Coimbatore.
2. IHRDC Instructional Sign Language Video CD version (2003), Coimbatore.
3. Jayannath. M, (2004). Deaf and Dumb Education, New Delhi, Deep and Deep Publications.
4. Pease, A. (2007). Body Language- How to road others thoughts by their gestures. New Delhi: Competition Review Pvt. Ltd.

5. Prabhakar, N. (2007), Introduction to Communication, New Delhi, Mittal Publishers.

Course Outcomes:
On completion of the course the student will be able to
1. outline the Concept, characteristics and features of sign language
2. be competent in applying sign language
3. acquire knowledge on primary and basic concept of sign
4. facilitate the use of signs for grammatical words and marks
5. sensitize and develop the skill of interpretation on sign language

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	L	L	L			M	L	L	L	L	L		L	L
CO 2	L	L	M		L	L	M	M	M	L	L	L	L	L
CO 3	M	L	L			L	L	L	L	L	L		L	L
CO 4	L	L	L			L	L	L	L	L	L		L	L
CO 5	L	L	L				M	L	H	L	L		L	L

Abstract Algebra – II

Semester VI   **Hrs of Instruction/week: 5**
21BSMC17   **No. of Credits: 3**

Course objectives:

1. To learn the concepts in Euclidean rings.
2. To know about vector spaces, Quotient spaces and Dual spaces.
3. To understand the concept of inner product spaces.

Unit 1

Euclidean Ring: Euclidean Rings - Principal ideal ring - Greatest common divisors - Associates - Prime elements - Relatively prime elements - Unique factorization theorem **15** - Characterization of maximal ideals of the Euclidean ring -Definition of J[i], J[i] a particular Euclidean ring - Fermat's theorem.

Unit 2

Vector Spaces: Elementary basic concepts of vector spaces - Examples - Subspaces - **15** Homomorphisms of vector spaces - Internal and external direct products - linear combinations - linear span - linear independence and dependence - Basis and its properties.

Unit 3

Quotient Spaces: Dimension of a vector space -Quotient space and its dimension - The **15** vector space of Homomorphisms.

Unit 4

Dual Spaces: Dual spaces - Dimension of a dual space - Annihilator of a subspace – **15** Dimension of annihilator - Linear homogenous equations.

Unit 5

Inner product spaces: Definition of inner product spaces - Example - Schwarz equality **15** -Orthogonal elements of a space - Orthogonal complement of a subspace - Finite inner product spaces - Orthonormal basis.

Total Hours   75

Text Book:
1. *I.N. Herstein (2007).*"***Topics in Algebra",*** John Wiley & Sons, New York, 2ⁿᵈ edition.

Reference Books:

1. *D.S.Dummit and Richard M.Foote (2004).* **"Abstract Algebra"**, Wiley India, 3ʳᵈEdition.

2. *VivekSahai and VikasBist (2008).* **"Algebra",** Narosa Publishing House, New Delhi.

3. *John B.Fraleigh (2005). **"A First Course in Abstract Algebra"**,* Dorling Kindersley Pvt.Ltd., 7ᵗʰEdition.

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

1. Apply the Euclidean ring concepts to the Gaussian integers.
2. Analyze finite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces.
3. Study the concepts of Quotient space and its dimensions
4. Utilize the dimension of annihilator concepts to study the system of linear homogeneous equations.
5. Compute inner products and determine orthogonality on vector spaces.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	M			L	L	M	H	H	M		M	M	M	
CO 2	M			L	L	M	L	H	M		M		M	
CO 3	M			L	L	M	H	H	M		M	M	M	
CO 4	M			L	L	M	L	H	M		M		M	
CO 5	M			L	L	M	H	H	M		M	M	M	

Real Analysis – II

Semester VI   **Hrs of Instruction/week: 5**
21BSMC18   **No. of Credits: 3**

Course objectives:
1. To know about the concepts of Connectedness and Uniform Continuity.
2. To understand the concept of Derivatives.
3. To learn the fundamental concepts of Functions of Bounded Variation.

Unit 1

Limits and Continuity: Continuity and inverse image of open or closed sets - Functions **15** continuous on compact sets - Topological mappings (homeomorphisms) - Bolzano's theorem - Connectedness.

Unit 2

15

Uniform continuity: Uniform continuity and compact sets - Fixed-point theorem for contractions - Discontinuities of real-valued functions - Monotonic functions.

Unit 3

Derivatives: Introduction **-** Definition of derivative - Derivatives and continuity - **15** Algebra of derivatives - The chain rule - One-sided derivatives and infinite derivatives.

Unit 4

15

Derivatives Continued: Functions with non-zero derivatives - Zero derivatives and local extrema - Rolle's theorem - The mean- value theorem for derivatives - Intermediate-value theorem for derivatives - Taylor's formula with remainder.

Unit 5

Functions of Bounded Variation and Rectifiable Curves: Introduction - Properties of monotonic functions - Functions of bounded variation - Total variation. Additive **15** property of total variation - Total variation on [a, x] as a function of x - Functions of bounded variation expressed as the difference of increasing functions - Continuous functions of bounded variation.

                                                                 Total Hours 75

Text Book:
1. *T. M. Apostol (2002). **"Mathematical Analysis",*** 2ᵈ Edition, Narosa Publishing House, 12ᵗʰ Reprint.

Reference Book:

1. *Richard R. Goldberg (1970). **"Methods of Real Analysis",*** Oxford & IBH publishing CO. Pvt. Ltd., New Delhi.

Course Outcomes:

On completion of the course, the students will be able to

1. Produce proper examples for continuous functions.
2. Distinguish continuity and uniform continuity.
3. Understand the differentiability of real functions and its related theorems.
4. Utilize the standard theorems on derivatives.
5. Apply the concept of bounded variation in continuous functions.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1						M	H	M	M		H	L	M	
CO 2						M	H	M	M		H	L	M	
CO 3		L		L		M	H	L	L		H	M	M	
CO 4	L	L		L		M	H	L	L		H		M	
CO 5	L	L				M	H	L	L		H	M	M	

| Semester VI | Hrs of Instruction/Week | : 5 |
| 21BSMC19 | No. of Credits | : 3 |

Course objectives:
1. To learn Taylor's and Laurent's series of complex functions.
2. To classify singularities of a function and its behavior.
3. To understand the application of Residue Theorem.

Unit 1

Cauchy's Theorem and its applications: Zeros of an analytic function - Theorems based on Cauchy's theorem - Cauchy's inequality - Liouville's theorem - Maximum modulus theorem**.**   **15**

Unit 2   **15**

Taylor's and Laurent's Series: Singular points - Isolated and non-isolated singular points - Taylor's and Laurent's Series - Taylor's series - Laurent's Series - Examples**.**

Unit 3   **15**

Singularities: Classification of isolated singularities - Removable singularity -Poles - Essential singularity - Behavior of a function at a singularity - Behavior at a removable singularity - Behavior at a pole - Behavior at an essential singularity - Examples.

Unit 4   **15**

Residues: Residue at a removable singularity - Residue at a pole - Residue theorem - Examples.

    15

Unit 5

Definite Integrals: Definite integrals - Type 1 - Type 2 - Examples.
    Total Hours   75

Text Book:

1. *P. Duraipandian and K.Pachaiyappa (2009).* **"Complex Analysis",** Muhil Publishers, Chennai.

Reference Books:

1. *S. Arumugam, A. Thangapandi Isaac and A. Somasundaram (2004).* **"Complex Analysis",** Scitech Publications, India, Pvt., Ltd.
2. *J.N. Sharma (1991).* **"Functions of a complex variable",** Krishna Prakashan Media.

Course Outcomes:

On completion of the course, the students will be able to

1. Understand the zeros of analytic function and applications of Cauchy's theorem
2. Expand complex functions as Laurent's and Taylor's series.

3. Classify the singularities and analyze the behaviour of a function at its singularities.
4. Determine the residues of a function.
5. Apply residue theorem to evaluate integrals.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	L	L		M		M			H		H	H		
CO 2	L	L		M		M			H		H	H		
CO 3	L	L		M		M			H		H	H		
CO 4	L	L		M		M			H		H	H		
CO 5	L	L		M		M			H		H	H		

Operations Research

Course objectives:
1. To learn various analytical methods to solve problems in Operations Research.
2. To provide a scientific basis to make optimal solutions in policies.
3. To know the applications of Operations Research in industries.

Unit 1

Linear Programming Problem: Mathematical Formulation of the Problem - Graphical Solution Method - Some Exceptional Cases - General Linear Programming Problem - Canonical and Standard Forms of L.P.P. **12**

Unit 2

Simplex Method: Fundamental Properties of Solutions - The Computational Procedure - Use of Artificial Variables - Solving LPP for minimizing and maximizing functions using Big M method - Two – phase method - Degeneracy in Linear Programming. **12**

Unit 3

Transportation and Assignment Problems: Introduction - Mathematical Formulation of the Problem - Triangular Basis - Loops in a Transportation Table - Finding Initial Basic Feasible Solution - Test for Optimality - Degeneracy in Transportation Problems - Transportation Algorithm - Unbalanced Transportation Problems - Introduction to assignment problems - Mathematical Formulation - solution methods of Assignment Problem - Special cases in Assignment problems - A Typical Assignment Problem. **12**

Unit 4

12

Games and Strategies: Introduction - Two-Person Zero-Sum Games – Maximin, Minimax Principle - Games Without Saddle Points-Mixed Strategies - Graphic solution of 2 x n and m x 2 games - Dominance Property.

Unit 5

12

Sequencing Problems: Introduction - Problem of Sequencing - Processing n Jobs through 2 Machines - Processing n Jobs through k Machines - Processing 2 Jobs through k Machines.

Total Hours 60

Text Book:

1. *Kanti Swarup, P.K. Gupta, Manmohan (2010).* ***"Operations Research",*** S. Chand and Sons (Fifteenth Edition), New Delhi.

Reference Book:

1**.** Hamdy A.Taha (2011), "Operations Research", Prentice Hall of India Private Ltd, New Delhi,

Nineth Edition.

Course Outcomes:

On completion of the course, the students will be able to

1. Construct Mathematical models for the real-time situations.
2. Understand the mathematical tools needed to solve optimization problems
3. Find optimum solutions for transportation and assignment problems.
4. Understand the game theory for decision support system.
5. Apply optimum sequence algorithm for smooth functioning of an industry.

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	H	M	H	M	M	H	H	M	H	M	H	M	M	H
CO 2	M	M	H	M	M	H	H	L	H	M	M	H	M	H
CO 3	M	M	H	M	M	H	H	L	H	L	M	H	M	H
CO 4	H	M	H	M	H	H	H	M	H	L	H	M	M	H
CO 5	M	M	H	M	M	H	H	H	H	M	M	H	M	H

Department of Special Education
DSE III – Education and Rehabilitation Approaches for Persons with Disabilities
(for Human Development students)

Semester III   **Hours of Instruction / week: 4 + 3**
21BHDI03   **No. of credits: 5**

Objectives:
To enable the students to
1. define the concept of special education
2. describe the concept & characteristics of various disabilities
3. examine educational programmes for children with disabilities
4. state various models of rehabilitation approach
5. outline policies and provisions for persons with disabilities in India

Unit 1 Concept of Special Education:

Concept, Meaning and Definition of Special Education, Concept of Impairment, Disability and Handicap, Accessibility for the differently abled. **12**

Unit 2 Types and Characteristics of Persons with Disabilities

Sensory Disabilities: Visual Impairment, Hearing Impairment, Locomotor disability, Developmental Disabilities: Intellectual Disability, Learning Disability, Autism Spectrum Disorder **12**

Unit 3 Educational Programmes for Children with Disabilities

Special School, Inclusive School: Inclusive Education for the Disabled – Sarva Shiksha Abiyan (IED–SSA), Inclusive School: Inclusive Education for the Disabled at Secondary Stage (IED- SS).Inclusive Education under Samagra Shiksha Abhiyan **11**

Unit 4 Concept of Rehabilitation:

Concept and Definition of Rehabilitation- Components of Rehabilitation: Medical, Early Intervention, Education and Vocational **13**

Unit 5 Legal Provisions in India:

Rehabilitation Council of India Act (1992), National Trust Act (2000), Right to Persons with Disabilities Act (2016). **12**

Total Hours: **60**

Practicum: **Hours of Instruction / week: 3**
- Participation in Medical Camp
- Observe and report on Early Intervention and Day Care programmes
- Observe and report Inclusive Education and Special School programme

- Observe and report Institution Based and Community Based Rehabilitation programme
- Identify trades useful for persons with Visually Impaired, Hearing Impaired, Orthopedically Handicapped, Intellectual Disabled and Multiple disabled
- Identify any two private enterprise offering employment to PwDs and prepare two case studies.

Total Hours: 45

Text Books:
1. Hambury. M. (2006). Educating Pupils with Autism Spectrum Disorders. New Delhi. Paul Chapman.
2. Narayan, J. (2003). Educating Children with Learning Problems in Primary Schools. Book for Teachers, Secunderabad, NIMH
3. Pebbett. K. (2006). Management of Cerebral Palsy, New Delhi, Sage Publishers.

Reference books:

1. Prasasd . J and Prakash. R (2007). Education of the Handicapped Children. New Delhi, Kanishka Publishers.
2. Reddy .G. L. and Kusuma. M. (2000). Education of Children with Special Needs, New Delhi, Discovery Publishers.
3. Saini. J. S. (2005). Vocational & Technical Education for the Disabled, Chandigarh Abishek Publishers.
4. Singh A.K. (2008). Rights of the Disabled – Perspective, Legal Protection and Issues, New Delhi, Serials Publications.
5. Vijayan.P. and Geetha.T. (2006). Integrated and Inclusive Education. New Delhi, Kanishka Publishers.

Course Outcomes:
On completion of the course the student will be able to
1. have an overview on the concept of special education
2. specify different categories of disabilities
3. state the educational services for children with disabilities
4. summarize national policies and acts for PwDs
5. record on educational and rehabilitational programme

CO/ PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO1	PSO2	PSO3
CO1						H	M					H		
CO2	M	M	M		M	H	M	M				M	H	
CO3	H	M	H	M	H	M	M	M	M	M	M	M	M	H
CO4	H	M	M	M	M	L	L	L	H	L	H	H	M	M
CO5	M	M	H	H	M	H	H	H	L	M	M	M	M	H

Department of Special Education

Generic Elective Course
Introduction to Disabilities

Semester V
21BSEO01

Hours of Instruction / week : 2
No. of credits : 2

Objectives:

To enable the students to:
1. have an overview on the concept and different categories of disabilities
2. explain the educational services for persons with disabilities
3. specify major legal provisions for PwDs

Unit 1 Concept of Disability :

Concept, meaning and nature of disability - Difference between Impairment, disability and handicap - Evolution of attitudinal changes towards disability - myths and facts.   **6**

Unit 2 Types and Characteristics of Physical Disabilities :

Visual Impairment – Blindness, Low Vision - Hearing Impairment – Deaf, Hard of Hearing, Speech and Language Disability – Locomotor Disability, Cerebral Palsy, Dwarfism, Leprosy Cured   **6**

Unit 3 Types and Characteristics of Intellectual Disability:

Intellectual Disability, Specific Learning Disabilities, Autism Spectrum Disorder   **6**

Unit 4 Educational Programme :

Special School - Integrated Education - Inclusive Education   **6**

Unit 5 Legal Provision for PwDs in India:

6

Rehabilitation Council of India Act (1992), National Trust Act (2000), Right to Persons with Disabilities Act (2016).

Total Hours :   30

Text Books:
1. Prasasd. J and Prakash. R (2007). Education of the Handicapped Children, New Delhi: Kanishka Publishers.
2. Hambury. M. (2006). Educating Pupils with Autism Spectrum Disorders. New Delhi. Paul Chapman.

3. Narayan, J. (2003). Educating Children with Learning Problems in Primary Schools. Book for Teachers, Secunderabad, NIMH
4. Pebbett. K. (2006). Management of Cerebral Palsy. New Delhi. Sage Publishers.
5. Vijayan.P. and Geetha.T. (2006). Integrated and Inclusive Education, New Delhi: Kanishka Publishers.

References:
1. Dhawan. M.L, (2011) Education of Children with Special Needs, Hardcover, Isha Publishers, Vadodara, Gujarat, India.
2. Heward, L.W, (2012), Exceptional Children: An Introduction to Special Education, Student Value Edition 10th Edition, Pearson Publishers, Noida, Delhi, India.
3. Madhubala. J. (2007). Hearing Impaired Students, New Delhi : Discovery Publishers.
4. Mangal, S.K. (2007), Educating Exceptional Children: An Introduction to Special Education, Prentice Hall India Learning Private Limited, Delhi, India.
5. Mani, M. N. G. (2000). Inclusive Education – In Indian Context. Sri Ramakrishna Mission Vidyalaya, Coimbatore.
6. Panda, K.C, (1997), Education of Exceptional Children, Vikas Publishers, Noida, Delhi, India.
7. Prasaad. J and Prakash. R (2007). Education of the Handicapped Children. New Delhi. Kanishka Publishers.
8. Reddy .G. L. and Kusuma. M. (2000). Education of Children with Special Needs. New Delhi. Discovery Publishers.
9. Rehabilitation Council of India (2003). Status of Disability in India – 2003, New Delhi. RCI.

Course Outcomes:
On completion of the course the student will be able to
1. outline the concept of disabilities
2. describe the types and characteristics of physical disabilities
3. describe the types and characteristics of intellectual disabilities
4. examine the educational programmes for children with disabilities
5. specify major legal provisions for PwDs in India.

Department of Special Education
Value Added Course

Orientation to Sign Language

Semester III   **Hours of Instruction : 40 hrs**
21BSEV01   **No. of credits   : 2**

Objectives:
To enable the students to:
1. acquire knowledge and competence in use of sign language
2. acquire knowledge on primary and basic concept of sign
3. develop the skill of interpretation on sign language.

Unit 1 Introduction to Signs:

5

Concept of sign language, characteristics and features of sign language - one and two handed alphabets.

Unit 2 Primary Sign:

Members of the family - house hold activities - fruits, vegetables – food - numbers (1 to 1 lakhs).   9

Unit 3 Signs of Basic Concepts:

Colours – festivals – shapes – animals - time - birds - transport, professionals, months, days, place and religion.   8

Unit 4 Signs on Grammatical Markers:

9

Verbs, Tense, Adjectives, Preposition – WH question form

Unit 5 Interpretation of Sign Language:

9

Interpretation of conversation, meeting, song and story.

Total Hours :   40

Text Books:
1. Dash, N, (2003). Integrated Education for Children with Special Needs, New Delhi, Dominant Publishers.
   2. Asmita.H, (2006). Language and Communication, New Delhi, Kanishka Publishers.
   3. IHRDC Indian Sign Language Dictionary 2001.

References:
1. Jayannath, M. (2004). Deaf and Dumb Education, New Delhi, Deep and Deep Publications.

2. Pease, A. (2007). Body Language- How to road others thoughts by their gestures. New Delhi: Competition Review Pvt. Ltd.
3. Prabhakar, N. (2007). Introduction to Communication, New Delhi, Mittal Publishers.
4. IHRDC Instructional Sign Language Video CD version, Coimbatore, 2003
5. Holy Cross Service Society (2002), Modes of Communication for Hearing Impaired Video CD, version, Coimbatore.

Course Outcomes:
On completion of the course the student will be able to
1. outline the Concept, characteristics and features of sign language
2. get knowledge and competence in use of sign language
3. acquire knowledge on primary and basic concept of sign
4. facilitate the use of signs for grammatical words and marks
5. sensitize and develop the skill of interpretation on sign language