

**Department of Biotechnology**

**Star College Scheme**

**Progress report by Stella Maris College (Autonomous) Chennai**

**For the academic year 2012-13**

**1. Name of the College : Stella Maris College (Autonomous), Chennai**

**2. Name of Departments supported : Botany, Zoology, Chemistry, Physics**

Name of the Principal : Dr. Sr. Jasintha Quadras fmm  
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044- 28111987/ 28111951

Name of Coordinator : Dr. Juliana Joe  
designation, address, phone nos. Vice Principal & Associate Professor  
Dept. of Zoology  
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044- 28111987/ 28111951

**3. No. of regular faculty with Ph.D. in each participating department:**

S. No	Department	No. of Faculty	
		Aided	Management
1	Botany	5	1
2	Zoology	5	1
3	Chemistry	4	2
4	Physics	1 + 2* (*pursuing Ph.D.)	1* (*pursuing Ph.D.)

**4. List of courses run by different participating departments:**

Department	Regular Course	Certificate Course
Botany	B.Sc. Plant Biology and Plant Biotechnology	Herbal Therapy and Beauty Care (UGC Sponsored)
Zoology	B.Sc. Advanced Zoology and Biotechnology	Medical Biotechnology Diploma in Medical Laboratory Technology
Chemistry	B.Sc. Chemistry M.Sc. Chemistry	-
Physics	B.Sc. Physics	-

**5. Admission in different courses in participating departments in 2012-13 academic session:**

S.No.	Department	Cut off % for admission	No. of students admitted	No. of drop out students	% of results
1	Botany	60	37	6	70.83
2	Zoology	75	46	6	88.46
3	Chemistry	60	50	1	81.40
4	Physics	80	51	-	80.00

**6. Activities carried out during the year (department wise):**

**A) Student activities**

**i. Industrial visit / Field Visits**

Department	Particulars
Botany	<ul style="list-style-type: none"> <li>Laboratory visit for III year students to School of Biotechnology, Sathyabama Deemed University on August 8, 2012.</li> <li>Visit to Kovalam Seashore to study the habitat of sea weeds and to learn Herbarium techniques for Marine Algae by I year students on August 10, 2012.</li> <li>Visit to Thandarai, Chengalpet to study biodiversity of higher plants and for the collection of plants for herbarium preparation by II year students on August 11, 2012.</li> <li>Visit to CFTRI, Mysore by III year students on August 23, 2012.</li> <li>Visit to Irulas Tribal Women's Welfare Society at Chengalpet to study the biodiversity and medicinal value of herbs by II year students on August 23, 2012.</li> <li>Eco industrial visit for I and II year students to Larsen &amp; Tourbo EDRC Green Building, Manapakkam on February 19, 2013.</li> </ul>
Zoology	<ul style="list-style-type: none"> <li>I year students visited the Zoological Survey of India on August 6, 2012 as part of their Invertebrata curriculum to observe the specimens in the Museum and learn about Systematics.</li> <li>Students of the General Elective "Pet Care" visited the Blue Cross &amp; ZSI.</li> <li>III year students visited the Genetics, Microbiology, Bioinstrumentation, Immunology and Biotechnology laboratories at Tamil Nadu Veterinary and Animal Sciences University, Chennai in order to acquaint themselves with current trends and sophisticated instruments used in these laboratories on August 30, 2012.</li> <li>II year students visited the Sri Ramachandra University, familiarized themselves with the working of instruments, karyotyping and advanced microscopes on September 6, 2012.</li> </ul>

Department	Particulars
Zoology	<ul style="list-style-type: none"> <li>• III year Major Elective Bioinstrumentation students visited Scansworld to get an idea about the construction and working of Bioinstruments used for diagnostic and research purposes on September 12, 2012.</li> <li>• On a Nature Trail - Nature Walk - I Year students participated on a nature walk at the Guindy national park on January 22, 2013. The walk enabled students to appreciate the richness of our local biodiversity.</li> </ul>
Chemistry	<ul style="list-style-type: none"> <li>• I year students visited ANABOND, Perungudi on October 06, 2012. Lecture cum demonstration on polymers-raw materials, preparation applications and analytical techniques for characterization.</li> <li>• I year students visited different laboratories at CLRI (Central Leather Research Institute) on March 7, 2013. They were exposed to sophisticated analytical instruments such as DTA, TGA instruments, Gel permeable chromatography and NMR.</li> <li>• II year students visited Diet-aqua, drinking water plant process and quality control from May 2, 2013 to May 25, 2013.</li> </ul>
Physics	<ul style="list-style-type: none"> <li>• The III year students visited Lifeline Hospital on October 3, 2012 and were exposed to the medical instruments working under physics principles. They had demonstrations on the CT, MRI and NMR scanning.</li> </ul>

## ii. List of projects taken by students

Department	Details
Botany	<p>Five students of III year Botany took up projects under the Star College Scheme on the following research topics. Students were trained on review of literature, collection of data, materials and methods to perform the experiments inclusion of references, to tabulate observation and results and lastly discussion on their findings.</p> <ol style="list-style-type: none"> <li>1. Studies on Antimicrobial activity of <i>Vitexnegundo Linn.</i> and combined action of Ethyl acetate extract of <i>Vitexnegundo Linn.</i>, <i>Azadirachta indica A. Juss</i> and <i>Piper betel Linn.</i> on some bacterial pathogens.</li> <li>2. Studies on Antimicrobial activity of <i>Azadirachta indica A. Juss</i> and combined action of Ethyl acetate extract of <i>Azadirachta indica A. Juss</i>, <i>Vitexnegundo Linn.</i>, and <i>Piper betel Linn.</i> on some bacterial pathogens.</li> <li>3. Studies on Antimicrobial activity of <i>Piper betel Linn.</i> and combined action of Ethyl acetate extract of <i>Piper betel Linn.</i>, <i>Azadirachta indica A. Juss</i> and <i>Vitexnegundo Linn.</i>, on some bacterial pathogens.</li> </ol>

Department	Details
Botany	<p>4. Antioxidant Activity of Some Fresh Vegetables.</p> <p>5. Determination of Antioxidant Efficacy in few Vegetables and a comparative study of the components contributing to Antioxidant Activity.</p> <p><b>Group projects done by III year students</b></p> <ul style="list-style-type: none"> <li>❖ Total chlorophyll content in various leaves (green/coloured) by Colorimetric method.</li> <li>❖ Amylase activity – Enzyme kinetics</li> <li>❖ Enzyme – Substrate relationship with respect to Peroxidase.</li> <li>❖ Induction of root in stem cuttings using IAA.</li> <li>❖ Estimation of proteins from pulses by colorimetric method.</li> <li>❖ Estimation of oil content from Groundnut using soxhlet method</li> <li>❖ Effect of temperature and pH on Bacterial growth</li> <li>❖ Demonstration of motility test for bacteria.</li> <li>❖ Testing the potability of various water samples using coliform test</li> <li>❖ Methylene blue reductase test for milk samples</li> <li>❖ Wine production and estimation of lactic acid</li> <li>❖ Assessing antimicrobial properties of antibiotic disc, turmeric and disinfectants.</li> </ul>
Zoology	<p><b>Group projects done by III year students</b></p> <p><b>Genetics</b></p> <p>After participating in the workshop on “<i>Drosophila Culture Techniques</i>” the following projects have been carried out by III Year students.</p> <ul style="list-style-type: none"> <li>❖ Effect of green tea extract on the life cycle of <i>Drosophila melanogaster</i></li> <li>❖ Effect of alovera extract on the life cycle of <i>Drosophila melanogaster</i></li> <li>❖ Effect of nicotine extract on the life cycle of <i>Drosophila melanogaster</i></li> <li>❖ Effect of vitamin supplementation on the life cycle &amp; life span of <i>Drosophila melanogaster</i></li> <li>❖ Study of fruit preference in <i>Drosophila melanogaster</i></li> <li>❖ Verification of sex linked inheritance</li> <li>❖ Study on attraction of mutant flies to different odours</li> <li>❖ Prefer natural esters to artificial esters – a study in <i>Drosophila melanogaster</i></li> <li>❖ Maternal manipulation of offspring sex ratio in <i>Drosophila melanogaster</i></li> <li>❖ Larval phototaxis in <i>Drosophila melanogaster</i></li> </ul> <p><b>Animal Behaviour</b></p> <ul style="list-style-type: none"> <li>❖ Mating &amp; other common behaviours in Guppies</li> <li>❖ A study on the behavioural pattern of Goldfish</li> <li>❖ A study of the behavior of Rhesus monkey</li> <li>❖ A study on the behavior of Jackals in captivity</li> </ul>

Department	Details
	<ul style="list-style-type: none"> <li>❖ A study of the behavior of the spotted deer at IITM</li> <li>❖ Study of aggression, interaction &amp; mate selection in Budgerigar love birds</li> <li>❖ A comprehensive study of the behavior of a rescued dog</li> <li>❖ The general behaviours of Catfish</li> <li>❖ A study on the behavior of Ducks</li> </ul>
Chemistry	<p><b>Group projects done by II year students</b></p> <ul style="list-style-type: none"> <li>❖ Water analysis</li> <li>❖ Adulterants in food</li> </ul>

### iii. Excursions

- The III B.Sc. students of the following departments went on an excursion to different places.
  - Botany - Mysore
  - Chemistry - Kodaikanal
  - Physics - Kodaikanal

### iv: Any Other:

Department	Details
Botany	<ul style="list-style-type: none"> <li>• Six III year students presented the following papers in the <b>National Conference on Role of Traditional Knowledge in Biodiversity Conservation, Livelihood and Sustainable Development</b> under the guidance of Dr. Satyabama. S and Dr. Pricilla Jebakumari           <ul style="list-style-type: none"> <li>○ “A study on <b>inhibitory activity of leaf extracts of <i>Vitexnegundo Linn. AzadirachtaindicaA.Jussand Piper betel Linn. against few pathogenic bacteria</i>”.</b></li> <li>○ “<b>Antioxidant Activity of few traditionally used vegetables</b>”</li> </ul> </li> <li>• <b>Tree Census Programme:</b> The department, in collaboration with the Forest Department of Tamil Nadu, has been conducting this programme. A batch of 35 students of II year Botany participated in this venture and conducted the survey in three areas namely Adayar, Indira Nagar and TTK Road. Tree census involved collecting data on height and width of plant, taxonomic identification, ranking of stress factors and highlighting temple and heritage trees. The students were able to collect information on tree census for about 750 trees approximately.</li> <li>• <b>Service Learning</b> – Awareness created on “The Nutraceutical aspects of Mushroom and its Cultivation” in neighbouring schools and self help groups</li> <li>• <b>Intercollegiate Competition - ASTERA 2012</b> was organized on October 3, 2012. Botany students from 13 Colleges participated in various events.</li> </ul>

Department	Details
Zoology	<ul style="list-style-type: none"> <li>• <b>Service Learning</b> - II year students organized a campaign on health, hygiene and nutrition for school children and women in different communities. Input Sessions on Various Health Issues such as Oral Hygiene, Birth defects, Eye Care and Low cost Nutrition were given to the students.</li> <li>• <b>Inter Collegiate Competition – Synapse 2012</b> was organized on <b>September 11, 2012</b>. It is an event with fun filled learning. Undergraduate students from 8 city Colleges participated in events like Channel Surfing, Adzap, Debate (English and Tamil), Creative writing (English and Tamil), Photography, Mind Quiz, Junk Model, Hand painting, Wild hunt, Quiz, Myriad, Paper and Poster Presentation.</li> <li>• Students from all three years participated in ‘Save the Ridleys Campaign’ which was culminated in the <b>Turtle Walk</b>. It was organized in collaboration with TREE Foundation. At the start of the walk there was a lecture on Conservation of Olive Ridley turtles followed by a documentary on the dwindling Ridleys. They had the opportunity to witness the rehabilitation of injured turtles at the TREE foundation – an experience which opened their eyes to the dangers faced by these reptiles.</li> <li>• <b>Wild Life Week – February 18 - 23, 2013</b> The WILD LIFE week celebrated by the department was a call to the student community to join hands with us to protect our biodiversity. The program created an awareness among the College and school students about the impact of environmental destruction on wild and pet animals. As part of this program the following activities were organised: <ul style="list-style-type: none"> <li>➤ <b>Save our Animals Rally</b> with attractive posters on conservation of wild life and compassion for animals.</li> <li>➤ A Documentary on “<b>Truth about Tigers</b>” by Shekar Dattatri was screened for the students and faculty of College.</li> <li>➤ <b>Awareness Campaign on Wildlife Conservation</b> was held at Monfort Community Development Service Schools, Pattinapakkam, St. Ann’s Matriculation School, Madhavaram, Rosary Matriculation School, Santhome and Assumption Higher Secondary School, Nungambakkam.</li> <li>➤ <b>Biodiversity of Chennai</b> - a lecture by Dr. Murugavel, Naturalist &amp; Head, Department of Humanities and Social Sciences, Sri Venkateswara College of Engineering highlighted the rich reptilian, avian and mammalian fauna in and around Chennai and deliberated on the threats posed to the by human inhabitants.</li> <li>➤ <b>Drawing Competition</b> was conducted as part of this campaign. Six hundred school students between the ages 6 to 15 participated in this competition and their drawings were</li> </ul> </li> </ul>

Department	Details
	<p>displayed in the College premises.</p> <p>➤ <b>Exhibits highlighting Causes and Concerns of Wild Life Depletion</b> were displayed by the students of the department to create an awareness about overexploitation of our natural resources and their implications on our wild life.</p>
Chemistry	<ul style="list-style-type: none"> <li>• <b>Service Learning - I U.G.</b> students visited the <b>Sacred Heart School</b>, Church Park Campus, Chennai as part of Service Learning on March 12, 2012. Awareness was created through skits, poster presentations, power point presentations on the topics Pollution and Food Adulterants. The main focus was to Safe Food &amp; Water and Save the Earth.</li> <li>• <b>Intercollegiate Competition - Reactions 2012</b> was organized on September 28, 2012. This event provided an opportunity for the students to showcase their organizational ability, exhibit their varied talents through events like Adzap, Dumbcharades, Chemtunes, Rangoli, Crossword, JAM and Quiz. Chemistry students from 12 Colleges participated in various events.</li> </ul>
Physics	<ul style="list-style-type: none"> <li>• <b>Intercollegiate Competition – Electra 2012</b> was conducted on September 7, 2012 to facilitate students of our College and city Colleges to meet one another and showcase their talents. About 100 participants from various Colleges took part actively in the events like Paper Presentation, Debate, Collage, Quiz, Junk Art and Experimental Physics.</li> <li>• The department conducted a one-day inter-collegiate annual lecture series "<b>Popular lectures in Physics</b>" on March 9, 2013 where eminent physicists rendered lectures from their area of expertise. The core purpose of this event is to inspire budding physicists and engross the students who would want to continue in the field of Physics with more knowledge.</li> <li>• <b>“PHYSIK”</b>, the annual Physics department magazine was released on March 9, 2013 by Dr C. K. Subramanian, Professor, Department of Material Science, V.I.T Vellore.</li> </ul>

### Internship

Department	Name of the Student	Particulars
Zoology	Danita Kripa Daniel	Was selected for the Project Oriented Biological Education (POBE) – 2012 at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) for three weeks in order to show them what the world of scientific and especially

		biological research held for them as a career.
	Rukmini Shekar Suneha Jagannathan Sri Vaishnavi RatnaKaratgi	Docent at Madras Crocodile Bank, Mamallapuram
Chemistry	Chriso Maria Thomas	Centre for Nanoscience and Nanotechnology, Kerala – May 6, 2012 to June 6, 2012 - Sorption experiment and Electrospinning technique.
	Radhika.K.R Shamily.S	Summer Internship at Diet Aqua from 25 <sup>th</sup> April to 12 <sup>th</sup> May 2013 on Physicochemical & Microbiological Analysis of Water Samples.
	Sai brinda.M	Internship at Kumaran Hospitals, Dept. of Oncology
Physics	Anju Sebastian	Summer Internship on Nanomaterials at IIT, Madras

## B) Teachers activity

### i. Workshop, Seminar attended

Department	Details
Botany	<ul style="list-style-type: none"> <li>Ms. Antony Rose Immaculate attended an International Workshop on <b>“Service Learning: Engagemant in Environment Action”</b> organised by Madras Christian College from August 1-3, 2012</li> <li>Dr. Sathya Bama attended an International Conference on <b>“Sustainable Utilization, Management and Conservation of Biosources”</b> organised by St. Joseph’s College, Trichy on January 10 and 11, 2013.</li> </ul>
Zoology	<ul style="list-style-type: none"> <li>Dr. Kalpana Ramanan attended an International Workshop on <b>“Service Learning: Engagement in Environment Action”</b> organised by Madras Christian College and UBCHEA-Hong Kong on Aug. 3, 2012.</li> <li>Dr. Rita Jayaraj and Dr. Miriam Cecilia Vassou attended a National Conference on <b>“Nurture your Genome- The Health Focus for Life”</b> organized by Wellness Solutions, at Indian Red Cross Society, Egmore on December 13, 2012.</li> </ul>
Chemistry	<ul style="list-style-type: none"> <li>Dr. Shiny John Vairamon, Ms. Avila Josephine, Ms. Revathi Ranganathan and Dr. Jaishree Naidu participated in the <b>“Workshop Ecofriendly Chemistry - A Microscale Approach”</b> held on July 17-18, 2012 organized by Anna Adarsh College for Women, Chennai.</li> <li>Faculty from the Department of Chemistry participated in two days</li> </ul>



Department	Details
	<p>“<b>National Workshop on Microscale Experiments in Physical Chemistry</b>” on November 23-24, 2012 at Stella Maris College, Chennai. It enables the use of ecofriendly, costeffective and time saving practices.</p>
Physics	<ul style="list-style-type: none"> <li>• Sr. Fransisco Nirmala attended a ‘<b>National Conference on Nanomaterials and their Application</b>’ organized by Anna University, Madurai on August 23- 24, 2012.</li> <li>• Sr. Fransisco Nirmala attended a ‘<b>National Conference on Advanced Materials</b>’ organized by Sacred Heart College, Thirupathur on September 28, 2012.</li> <li>• Sr. Fransisco Nirmala attended a ‘<b>National Conference on Nanomaterials</b>’ organized by Karunya University of Engineering on December 3-4, 2012.</li> </ul>

## ii. Training courses conducted for the students

Department	Details
Interdisciplinary	<ul style="list-style-type: none"> <li>• A Hands-on–training on “<b>Bioinformatics Tools for Sciences</b>” for students from the departments of Botany, Chemistry, Zoology and Physics from January 18<sup>th</sup> to 21<sup>st</sup>, 2013. Hands on training on <ul style="list-style-type: none"> <li>a) BLAST tool which helps to find the similarity between the sequences.</li> <li>b)Multiple Sequence Alignment and Phylogenetic analysis</li> <li>c)Visualizing the biomolecules using Rasmol</li> </ul> </li> </ul>
Botany	<ul style="list-style-type: none"> <li>• One day training programme on <b>Processing of Fruits and Vegetables</b> to learn various preservation techniques and their nutraceutical value at Rajaji Bhavan on July 2 &amp; 5, 2012.</li> <li>• <b>Hands on Training on Mushroom Cultivation</b> to learn the life cycle and economic importance of fungus (Pleurotus sp) on September 2012.</li> <li>• The Department conducted a Workshop on “<b>Histochemical Tests for Phytoconstituents of Therapeutic Value, Organoleptic study of Medicinal Herbs &amp; Microscopic Analysis of Powdered Drugs</b>” for the II year students from September 13-15, 2012. Students were given hands on experience on classification and identification of secondary metabolites with special reference to Tannin, Flavonoids, Alkaloids, Terpenoids, Glycosides, Saponin, Resin and phenols using Histochemical tests.</li> <li>• <b>Training in Mycological Techniques</b> from March 5-7, 2013.</li> </ul>

Department	Details
Botany	<p>The I Year UG Botany students were given hands on training in Mycological Techniques. It included study on Micrometry and Calibration of Microscopes. Experiments were designed to isolate and culture fungi from various sources (Air, Water, Soil, Wall and Tables in the laboratory). Students were also given training on culturing fungi using various media and inoculation techniques. After culturing they were taught to prepare semi-permanent slides and identify using macroscopic and microscopic characteristic of Fungi and to calculate the fungal population from various samples. The objective of this training programme was to teach the students to identify common fungi present in the environment and learn to differentiate the various thallus organizations of fungi and the spores they produce. Students felt the workshop was effective and motivated them to learn more about fungi and its influence on day today life.</p> <ul style="list-style-type: none"> <li>• <b>Training in Molecular Biology Techniques</b> on March 6-7, 2013.</li> </ul> <p>The two day workshop on Molecular Biology Techniques for the III year students was conducted to enlighten the students on the basic techniques involved in isolation and separation of proteins, DNA and running them on Agarose Gel Electrophoresis and SDS-PAGE.</p>
Zoology	<ul style="list-style-type: none"> <li>• A workshop on “<b>Drosophila Culture Techniques</b>” was conducted on July 22, 2012 for III U.G. students to gain knowledge on maintenance of flies, preparation of culture medium, identification of sex and to observe the developmental stages.</li> <li>• A Workshop on “<b>Vermiculture and Vermicomposting</b>” was organized in August 2012 for I year students. This workshop gave the students a hands-on experience on setting up a vermibed, culturing of earthworms and making use of this knowledge in vermicomposting. This eco-friendly method of waste management offers great scope for enterprising students who may wish to turn entrepreneurs.</li> <li>• A workshop on “<b>Herpetology</b>” was organized in collaboration with the Madras Crocodile Bank Trust on February 18, 2013 for I U.G. students which enhanced the knowledge on reptiles, creating awareness on the ecological status of the various reptiles.</li> </ul>
Chemistry	<ul style="list-style-type: none"> <li>• 5 students of III year chemistry attended a Workshop on <b>Laboratory Techniques</b> organised by the Department of Bioinformatics. They had Hands on Experience on the following techniques - Electrophoresis (Agar, SDS-PAGE),</li> </ul>

Department	Details
	TLC, PCR.
Physics	<ul style="list-style-type: none"> <li>• Workshop on <b>Microprocessor and Microcontrollers Interfacing Devices</b> for III year students was conducted on October 6, 2012. The application of microprocessor like Stepper motor, Traffic light regulator and interfacing with 8255A I/O were dealt on the workshop.</li> <li>• Workshop on <b>Learning Principles of Electronics Gadgets</b> on October 15, 2012 for I year students was conducted to make the students appreciate the working of simple electronic circuit used in everyday home appliances</li> <li>• Workshop on <b>Solar Energy</b> for II year students was conducted on February 19, 2013 and they were given lecture on solar energy and the ways of tapping the enormous amount of energy available for day today usage of energy.</li> </ul>

**iii. Guest lectures (Please mention Name, Designation, host institute of guest faculty invited)**

**Botany**

Name & Designation of the External Expert	Title of the lecture	Date
Dr. MujeeraFathima Govt. Arts College, Nandanam	Gene Transfer in Plants	18.2.2012

**Zoology**

Name & Designation of the External Expert	Title of the lecture	Date
Dr. Radha Venkatesan Senior Scientist, M.V Diabetic Clinic	Huntington's Disease	28.8.12
Dr. Vijayalakshmi, Assistant Professor, Dept. of Preventive Oncology, Cancer Institute, Adyar	DNA Sequencing and its Applications	26.9.12
Dr. Kalpana Gowrishankar, Genetic Consultant at Kanchi Kamakoti Child Trust Hospital, Nungambakkam	Hereditary Diseases and Genetic Counselling	5.10.12
	Pedigree Analysis and its application	9.7.12
Dr. V. Shantha MD,DGO Chairperson,Cancer Institute Adyar	Perspectives on Cancer	5.10.12
Dr. Mercy Valarmathi Kothandam, Academic Visiting Scientist, University of Reading, UK	Patenting and IPR	6.10.12

Ms. Gayathri Crocodile Bank, Mamallapuram	Ecological Modelling	10.10.12
Ms. Geema, Research Scholar, University of Portugal	Bioinformatics – Proteomics and Genomics	10.10.12

### Chemistry

Name & Designation of the External Expert	Title of the lecture	Date
Dr. Rukmani Srinivasan Former Head, Dept. of Chemistry Stella Maris College	Symmetry of molecules	22.6.12
Dr. Narasimha Swamy Senior scientist, CLRI	NMR Spectral studies – Polymer Materials	11.9.12
Ms. Asha Vargheese, Faculty, WCC	Cosmetics & Personal care	12.9.12
Ms. Vasundara, Cosmetologist	Cosmetics & Personal care	14.9.12 & 20.9.12
Dr. Meenakshi Scientist, Cavin Care	Types of Facials and Toners	28.9.12
Dr. S.N Jaisankar Senior scientist, CLRI	Rheology of polymers	9.10.12
Dr. Narasimha Swamy Senior scientist, CLRI	Fourth state of matter	16.10.12
Dr. Meenakshi Scientist, Cavin Care	Advantages & Applications of Cosmetics	19.10.12
Prof. Krishnan Raghavachari Indiana University, USA.	Chemistry Without The Glassware: Computational Approaches To Chemical Problems	12.12.12
Dr.U.V.Varadaraju Professor, IIT Madras	Lithium ion batteries	28.9.12
Dr. Jessuritta Sathian	Organic reaction mechanisms	6.10.2012
Dr. Roop Singh, Presidency College	Nanomaterials	1.2.13
Dr. Jaishankar	Polymer nanocomposites	7.3.13
Dr. Selvam IITM	Nanostructured materials for Sustainable (green) chemistry	4.9.12

### Physics

Name & Designation of the External Expert	Title of the lecture	Date
Dr. Kumar Sathian Retd. Professor, Madras Christian College, Chennai	Programming Techniques in Microprocessor 8085	6.10. 2012
Dr. Kumar Sathian Retd. Professor, MCC, Chennai	Learning Principles of Electronics Gadgets	15.10.2012
Dr. Kumar Sathian Retd. Professor, Madras Christian	Analog Digital Circuit	7.2.2013

College, Chennai		
Mr. Satish Professional Photographer	Film developing techniques in Black and White and on Photoshop	January 2013
Dr. C. K. Subramanian and Dr. Bhuveshwari .G	Renewable Energy	9.3.2013

#### iv. Exhibition

Department	Details
Botany	<ul style="list-style-type: none"> <li>• <b>Exhibition</b> of Traditional Cereals and Grains, Tribal Medicines, Products and Practices was organized in connection with the National Conference on “<b>Role of Traditional knowledge in Biodiversity Conservation, Livelihood and Sustainable Development</b>” from February 5-6, 2013.</li> </ul>
Zoology	<ul style="list-style-type: none"> <li>• <b>‘EXZOOBITION’</b> - Exhibition on various facets of Zoology was organized by I, II &amp; III year students on Feb. 6, 2013. This event is an experiential learning process and the thrust areas were Chordata, Applied Zoology, Microbiology, Environmental Biotechnology, Physiology, and Environment related issues.</li> </ul>

#### v. Any Other:

Department	Details
Botany	<ul style="list-style-type: none"> <li>• The Department of Botany in collaboration with C.P.R. Environmental Education Centre organized a National Conference on “<b>Role of Traditional Knowledge in Biodiversity Conservation, Livelihood and Sustainable Development</b>” from February 5-6, 2013.</li> <li>• <b>Herbal Garden</b> - It has 75 medicinal plants with Botanical name, common name and its medicinal uses indicated on placards. It is a learning experience for the students as they maintain Herbal garden.</li> <li>• Two manuals were prepared (<b>Histochemical Tests for Phytoconstituents of Therapeutic Value, Organoleptic study of Medicinal Herbs &amp; Microscopic Analysis of Powdered Drugs</b> and <b>A Practical Manual Record on Food Microbiology, Sanitation and Hygiene</b>)</li> </ul>
Zoology	<ul style="list-style-type: none"> <li>• The Department of Zoology organized a two day National Conference on “<b>Perspectives in Ethology</b>” from November 30-December 1, 2012. The conference discussed how the knowledge on animal behavior can be applied to conservation and management of endangered and exploited animal population. This conference enabled our UG students to interact with renowned ethologists which paved the way for summer internships in reputed institutions like</li> </ul>

	IISc.
Chemistry	<ul style="list-style-type: none"> <li>• National Conference on “<b>Micro Scale Experiments in Physical Chemistry</b>” was organized in collaboration with Central Leather Research Institute, Chennai on November 24-25, 2012.</li> <li>• A two day National Conference on “<b>New Frontiers Inorganic Chemistry and Process Research (NFOCPR- 2013)</b>” was organized in collaboration with Shasun Pharmaceuticals Ltd. on January 24-25, 2013.</li> </ul>

## 6. Advisory committee meeting:

### A) Constitution of advisory committee:

Chair Person	Dr. Sr. Jasintha Quadras fmm Principal, Stella Maris College
DBT Representative	Dr. Padma Singh Scientist-'C', Department of Biotechnology, Ministry of Science & Technology, New Delhi
External Experts (Members)	Dr. Uma Rajan, Associate Professor, Dept. of Botany, Pachiappas College Dr Kaleena P.K., Associate Professor Dept. of Zoology, Presidency College
Members (from all participating departments)	Dr Geetha Swaminathan, IQAC Coordinator & Associate Professor, Dept. of Chemistry Dr Nirmala Kanagaraj, Head & Associate Professor, Dept. of Botany Dr Annie Cherian, Head & Associate Professor, Dept. of Zoology Dr Rajini K.H., Head & Associate Professor, Dept. of Physics Dr Shiny John, Head & Associate Professor, Dept. of Chemistry Dr Priscilla Jebakumari, Academic Dean & Associate Professor, Dept. of Botany Ms Belina Xavier, Assistant Professor, Dept. of Physics Dr Miriam Vassou, Assistant Professor, Dept. of Zoology
Coordinator – Member Secretary	Dr Juliana Joe, Vice Principal & Associate Professor, Dept. of Zoology

### B) Advisory committee meeting conducted after implementation of scheme:

Date: **November 26, 2012** (Minutes enclosed)

**8. List of New Practicals/demonstrations introduced for UG students of each batch (I, II and III year) in different departments supported under Star College Scheme in last one year:**

The Science departments continued to conduct the new practicals introduced in 2011-12 for enhancing the experiential learning and the understanding of the basic principles involved in various practicals.

Department	Details
Botany	<ul style="list-style-type: none"> <li>• Isolation of photosynthetic pigments using different leaves by paper chromatography</li> <li>• Isolation and enumeration of bacteria and fungi using different isolation techniques</li> <li>• Microscopy – sectioning of various plant parts and double staining of the same for microscopic studies of stems, roots of higher plants and thallus of lower plant forms.</li> <li>• Maceration technique to study the vascular elements</li> <li>• Preparation of Grape wine, Ginger wine and Apple wine – Industrial Microbiology.</li> <li>• Grafting &amp; Budding – Demonstration – Horticulture at Agri Horticulture Society.</li> <li>• Preparation of Ayurvedic and Siddha medicines to learn pharmacognosical aspects of the medicine which included learning of binomial names, active principle, morphology and extraction process of chemicals.</li> <li>• Demonstration of separation of proteins using electrophoresis</li> <li>• Demonstration of composting techniques to learn the principle of biodegradation and to identify local earthworm varieties and their role in biodegradation</li> </ul> <p><b>The curriculum of the Elective paper on Food Microbiology and Sanitation has an inbuilt practical component. The following practicals are included.</b></p> <ul style="list-style-type: none"> <li>• Methylene Blue Reductase Test – To test the quality of milk</li> <li>• Effect of Enzymatic browning in Potato and Apple</li> <li>• Percentage of water content in Orange (different varieties)</li> <li>• Rate of Fermentation in wheat dough using yeast.</li> <li>• Refractometer – To check the sugar content of various fruits and fruit juices.</li> <li>• Preparation of Sauerkraut - Estimation of Lactic acid using volumetric analysis</li> </ul>
Zoology	<p><b>Invertebrata Practicals</b></p> <ul style="list-style-type: none"> <li>• Observation of habit, habitat, adaptive features of any ten invertebrates from the College campus</li> </ul> <p><b>Chordata and General Zoology - I Practicals</b></p> <ul style="list-style-type: none"> <li>• Dissection &amp; Display of the Viscera and Digestive system of Fish</li> <li>• Study of the life cycle of frog</li> <li>• Observation of habit, habitat, adaptive features of any ten</li> </ul>

Department	Details
Zoology	vertebrates from the College campus <b>General Zoology - I Practicals</b> <ul style="list-style-type: none"> <li>• Dissection &amp; Display of the Viscera and Digestive system of Fish</li> <li>• Observation of habit, habitat, adaptive features of any five invertebrate &amp; five vertebrates from the College campus</li> </ul> <b>Genetics and Cell and Molecular Biology Practicals</b> <ul style="list-style-type: none"> <li>• Hardy Weinberg Equilibrium- calculating gene frequency &amp; genotypic frequency using bead experiments</li> </ul> <b>Medical Laboratory Technology, Immunology and Biotechnology Practicals</b> <ul style="list-style-type: none"> <li>• Demonstration of Anatomical location of immune tissues &amp; organs in rat</li> <li>• Protein separation – SDS PAGE</li> </ul> <b>Microbiology</b> <ul style="list-style-type: none"> <li>• IMViC Test</li> </ul> <b>Physiology, Environmental Biology and Developmental Biology Practicals</b> <ul style="list-style-type: none"> <li>• Assessing digestion of proteins, carbohydrates &amp; fats using Phsio Ex 8.0</li> <li>• Study of frog cardiovascular physiology using Physio Ex 8.0</li> <li>• Quadrante analysis – population study</li> </ul>
Chemistry	<ul style="list-style-type: none"> <li>• Introduction of Microscale Techniques in Inorganic Analysis – I year, Organic Analysis – II year, and Physical Chemistry Experiments – III year</li> </ul>
Physics	<ul style="list-style-type: none"> <li>• Op amp mini trainer kits were used to perform basic operations like adder, subtractor, source follower etc.</li> <li>• Equipments like Abbe refractometer, visible spectrophotometer, Conductivity Bridge were introduced to students through mini projects.</li> <li>• Laser experiments were introduced for practicals</li> </ul>

### 9. DBT grant utilization:

A) Non-recurring : NIL

B) Recurring: Rs. 7,80,000 + 11,357 (Bank interest)

### 10. Qualitative improvements due to DBT support

- ❖ Students to take up higher studies in basic sciences and enter into research.
- ❖ Imparting entrepreneurial skills to students through various lectures cum demonstration such as Kitchen Garden, Wine Preparation, Mushroom Cultivation, Flower Arrangement and Fruit and Vegetable Processing, Vermitechnology, Water Analysis, Detection of Adulterants in Food etc.



- ❖ Publication of practical manuals to provide students with hands on experience and also serve as ready reckoners to both students and faculty.
- ❖ Financial assistance provided by the Scheme helped in the purchase of many consumables like reagents, glassware specimen etc. which enabled us to carry out practical classes more effectively.
- ❖ Conduct of more Workshops, Seminars and Training Programmes for students and faculty helped in upgrading practical knowledge and enhancing skills.
- ❖ Updation of Department Library by purchasing relevant books for new courses.
- ❖ Organization of guest lecture to enable students to interact with experts in the field.
- ❖ Organization of more Field Trips to further enrich the Teaching-Learning process.

**11. Problems faced, if any, in implementation of the programme and utilization of DBT grant:**

No specific problem was encountered. However there is a need to purchase more microscopes and equipments/instruments to enhance the practical learning of the students. If financial assistance is given under the Non - Recurring grant, new equipments can be purchased or damaged equipments can be replaced. This will enhance the experiential learning and broaden the scope of identifying one's inherent scientific skills.

**ACKNOWLEDGEMENT:**

The College places on record its sincere thanks to the Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India, for the financial support and opportunity given to strengthen the Basic Sciences. About 520 undergraduate students from four departments have been benefitted through this scheme and we hope that similar financial assistance will help the student community to pursue higher studies, plan a challenging career in the field of research and thereby benefit the society at large.

**Dr. Juliana Joe**  
Coordinator

**Dr. Sr. Jasintha Quadras fmm**  
Principal

# STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

## Minutes of the Advisory Committee Meeting

### Star College Scheme

**Date** : November 26, 2012  
**Time** : 2.30 p.m.  
**Venue** : Small Conference Room, CC Block

#### Members Present:

Chair Person	Dr. Sr. Jasintha Quadras fmm Principal, Stella Maris College
DBT Representative	Dr. Padma Singh Scientist-'C', Department of Biotechnology, Ministry of Science & Technology, New Delhi
External Experts (Members)	Dr. Uma Rajan, Associate Professor, Dept. of Botany, Pachiappas College Dr Kaleena P.K., Associate Professor Dept. of Zoology, Presidency College
Members (from all participating departments)	Dr Geetha Swaminathan, IQAC Coordinator & Associate Professor, Dept. of Chemistry Dr Nirmala Kanagaraj, Head & Associate Professor, Dept. of Botany Dr Annie Cherian, Head & Associate Professor, Dept. of Zoology Dr Rajini K.H., Head & Associate Professor, Dept. of Physics Dr Shiny John, Head & Associate Professor, Dept. of Chemistry Dr Priscilla Jebakumari, Academic Dean & Associate Professor, Dept. of Botany Ms Belina Xavier, Assistant Professor, Dept. of Physics Dr Miriam Vassou, Assistant Professor, Dept. of Zoology
Coordinator – Member Secretary	Dr Juliana Joe, Vice Principal & Associate Professor, Dept. of Zoology

- The meeting commenced with a prayer by Dr. Annie Cherian, Head, Dept. of Zoology.
- Dr. Sr. Jasintha Quadras, Principal, welcomed the members. She thanked the Dept. of Biotechnology for the financial assistance under the Star College Scheme which helped the Science Departments in buying equipments, conducting workshops etc. She also thanked the DBT for extending the scheme for a further period of three years.

- Dr. Juliana Joe read the minutes of the previous meeting and requested the departments – Zoology, Botany, Physics & Chemistry – to present the activities planned for this academic year.
- Dr. Miriam of Zoology Department presented the activities planned.
- Dr. Padma enquired if the DNA extractions were made by the conventional method or if kits are being used.
- Dr. Juliana responded that only conventional method was followed except for Isolation of Plasmid DNA for which kit is used.
- Ms. Immaculate of Botany Department presented the activities for the current academic year.
- Dr. Padma asked about the student strength of the III years and asked why only a limited number of students have undertaken the projects and if the topics were chosen by the students.
- Dr. Nirmala said that the topics were chosen by the students and guided by faculty. The number of students registered for the project is seven as the project is one of the Major Elective papers. However group projects are carried out by the III year students.
- Dr. Padma also asked about number and the condition of the compound microscopes. Dr. Nirmala stated that there is sufficient number of microscopes and that each student gets a microscope. She also explained about the maintenance of the compound microscopes.
- Ms. Belina of Physics Department presented the activities of the department.
- Dr. Padma asked how the Practical Experiments are planned and also enquired about the mini Projects undertaken by the students.
- Dr. Rajini explained that the students were divided into groups depending upon the number of experiments and follow a practical cycle every week.
- Dr. Shiny of Chemistry Department presented the activities of this academic year.
- Dr. Geetha explained how microscale techniques are useful and highlighted the significance of the same in the usage of less chemicals.
- Dr. Padma shared the feedback from the students for enhancing the teaching-learning process.
- Dr. Geetha explained how the suggestions and recommendations of the previous Advisory Committee meeting like Interdisciplinary Programmes, more thrust on principle and, training programmes are being carried out in the current year (2012-13); she also highlighted how the Star College Scheme is used to understand and learn basic scientific principles.

- Dr. Padma enquired about financial details and Dr. Geetha explained how the funds are allocated as per the DBT guidelines and UC is being sent to the DBT office.

#### **Suggestions by the External members**

Dr. Padma Singh, Dr. Uma Rajan and Dr. Kaleena appreciated the efforts taken by the Departments to implement the various activities under the Star College Scheme and made few suggestions.

- Dr. Uma Rajan asked if the Internship / Mini projects are compulsory.
- Dr. Shiny said that internship is not compulsory for UG students. Some students under the guidance of Faculty undertake internship in different institutions.
- Dr. Uma Rajan also suggested that Science Day could be organized to popularize Basic Sciences at the school level by inviting them to see the exhibition.
- Dr. Sr. Jasintha Quadras appreciated the concept and Dr. Juliana and Dr. Geetha said that all the Science departments would join together and conduct a Science Exhibition/Science Fair in the forthcoming year.
- Dr. Padma also suggested that Summer Internship be organized for all students on campus and that the students be allowed to choose their own topics for Seminar / Assignments. Based on the performance of the students, department wise, Star Student Award can be planned.
- Dr. Geetha briefed the members on how the seminar topics are generally chosen.
- Dr. Kaleena said that we could have a Journal publication by incorporating the activities of all the Science departments.
- Dr. Padma said that good lab practices must be taught to the students and equipments' working condition and standardization should be checked periodically.
- Dr. Uma Rajan suggested to increase the number of field / industrial visits for the students to enhance the practical exposure. Teachers can undergo Short Term training for a period of Three weeks.
- Dr. Padma suggested that the College could organize such training programmes for faculty, inviting participation from the neighboring Colleges also.
- Sr. Principal laid emphasis on Science Journal and Science Day.

The meeting ended with Vote of Thanks by Dr. Juliana Joe, Coordinator - Star College Scheme.