

**SHRISHIVAJI SCIENCE COLLEGE, AMRAVATI**  
**NAAC Accredited A Grade**  
Identified as: UGC-CPE, DST-FIST and SGBAU-Lead College

## **Clean and Green Campus Policy Document**

### **About College:**

This college comes under Shri Shivaji Education Society, Amravati which is a premier educational institution providing quality education since 1931. It is second largest in the state of Maharashtra. The college has been trying at its best to fulfill the aims and objectives of Dr. Panjabrao alias Bhausaheb Deshmukh who established this society especially to quench the thirst of the neglected and the downtrodden. This visionary leader has uplifted the whole of our region by establishing this education hub.

Ours is the first college in the entire S. G. B. Amravati University to have accredited with NAAC in 2001 with A Grade. This college is committed to provide quality education and promote research that will contribute to the continual development of our society. We are celebrating the Golden Jubilee Year of our college and we feel elated and proud to have achieved significant milestones like being identified as 'A' Grade College consecutively three times by NAAC, UGC-CPE, DST-FIST and University Lead College.

Taking into account the necessity of protecting environment for a sustainable, pollution-free and healthy life on the planet Earth in the coming years, the college has formed its Green Protocol. This is in tune with the vision of our founder President Dr. Panjabrao alias Bhausaheb Deshmukh who was also the first Agriculture Minister of free India. The college endeavours to follow this policy strictly by actually enacting to and also creating environmental consciousness among the students and thereby among the society in general by organizing various activities within and outside the campus.

The college works towards creating a green, pollution-free and healthy environment with a missionary zeal and dedication. The students are given strict instructions to maintain the campus clean and green and it is reflected in the college Prospectus.

### **The Clean and Green Campus Policy**

The Green Campus Policy of the college envisions a Clean and Green Campus where environmental friendly practices and education combine to promote sustainable and eco-friendly practices in the campus and beyond the campus. It also offers the institution an opportunity to take the lead in redefining its environmental culture through instilling environmental ethics among the students and staff.

### **Mission**

To create environmental consciousness among the society and actively involve in the activities to protect the planet earth from the unscrupulous human invasions for a sustainable, pollution-free and healthy life ahead.

### **Objectives**

- To sensitize the students and the staff to minimize the use of polluting products and use environment-friendly products and services.
- To instill the importance of cleanliness for a healthy life
- To Create awareness about environmental issues by organizing Events, Rallies, Awareness Campaigns, Cleanliness Drives, Seminars, Workshops, presentations, Tree Plantation Drives, Wildlife Photography Competitions, Rangoli Competitions, Essay Competitions, Bird Watching Programs, Excursions, Study Tours, Guest Lectures, Talks, etc.
- To make students and staff aware about raising voice against the hazardous practices destroying Nature and promote environment friendly practices among the society.

### **Initiatives Taken to Implement the Clean and Green Campus Policy**

The Institution is committed to managing its campus in accordance with its Clean and Green Campus Policy by establishing the following infrastructure and carrying out the following activities:

- **Landscaping with Trees and Plants**
- **Ban on Single-Use Plastic**
- **Observance of Green Thursday to Restrict the Use of Petrol/Diesel Vehicles**
- **30 Kv. Solar Plant in the College**
- **Street Lights Controller**

- **Use of LED Bulbs/Tubes and Power Efficient Equipments**
- **Solar Water Heater in the Girls' Hostel**
- **Rainwater Harvesting**
- **Biogas Plant**
- **Paperless Office and Communication**
- **Environmental Air Quality Monitoring of Amravati City and the Establishment of 'Continuous Ambient Air Quality Monitoring Station'**
- **Solid Waste Management**
- **Laboratory liquid waste management system through percolation system: -**
- **Hazardous Chemical Waste Management**
- **Water Management**
- **E-waste Management**
- **Display Boards to Promote Environmental Sensibility on College Campus**
- **Installation of Incinerator in the Girls' Common Room**
- **Observance of Days to protect and Nurture Environment**
- **The Green, Environmental and Energy Audit**
- **Dedicated Section for the Environment Consciousness in a creative Wall Magazine**

### **Landscaping with Trees and Plants**

As per the Clean and Green Policy of the Shri Shivaji Science College, Amravati, the college strives to plant various types of ornamental and medicinal variety, wild plant species of trees in large numbers within and outside the campus. Gardeners and full time adequate support staff have been appointed for the maintenance of gardens and keeping the campus litter-free, clean and Green Campus. The College Garden, Medico-Botanical Park, Green House and the Vermicompost Unit are looked after and maintained by the Department of Botany.

The tree-plantation drives are undertaken by the NSS and NCC Units of the college and also by the Departments of Botany, Zoology and the Environment Science on regular basis generally in the month of July every year.

### **Ban on Single-Use Plastic**

The campus of Shri Shivaji Science College, Amravati is a plastic-free campus where there is a complete ban on single-use plastics in classrooms, laboratories, canteen, hostel, and in the

other premises. The college facilitates environment friendly substitutes like stainless steel, washable and reusable tumblers at all water units and mandates the canteen to serve only in stainless steel or paper plates/glasses/cups to systematically ban the use of plastics on the campus.

### **Observance of Green Thursday to Restrict the Use of Petrol/Diesel Vehicles**

As per the suggestion of the Department of Environment Science of the college and also to ensure environmental consciousness, It is unanimously decided on the Ozone Day, 16September, 2017 by the college administration including the Teaching and Non-teaching staff of the college that now onwards, every Thursday will be observed as GREEN THURSDAY in the college campus and that the students and the staff of the college will be promoted to make use of bicycles, battery-operated E-bikes and the petrol/diesel vehicles will be restricted inside the college campus.

### **30 Kv. Solar Plant in the College**

The college has established the 30 Kv Solar Energy Plant on the Main Building of the college in March, 2018. Another Solar Plant has been installed on the Payoshni Girls Hostel. There is a substantial decrease in the MSEDCL Electricity Bills since the installation of these solar plants. The energy output of the solar panels are connected to the power grid of the MSEDCL where the power produced by the solar panels are supplied to the grid for which subsidy has been provided by the MSEDCL for the power consumption of the university.

Wheeling to the Grid is also done in the Payoshni Girls' Hostel. Solar Energy generated from the Plant is used by the dedicated solar panels which are installed on Girls Hostel building rooftop and solar energy is used to light up lights on the route from the main gate to the college building.

### **Street Lights Controller**

To minimize the use of electricity consumption and make the maximum utilization of the available resources, the college has installed Solar Photovoltaic Device with 20Wp PV module, 12Ah SMF battery, PWM Charge Controller, PV current sensing system for Dusk to Dawn fully automatic ON/OFF switching of street lights. 11 Sensor-based LED Solar Power Street Lights are installed from the entrance to the college

### Use of LED bulbs/ Power-Efficient Equipments

More than 90% electric lights and all the computers of the college are LED enabled. The other equipments are also purchased taking into account their power-efficiency.

### **Solar Water Heater in the Girls' Hostel**

Apart from the Solar Energy Plant for the Street Lights, Solar Water Heater is installed in the Payoshni Girls' Hostel of the college for fulfilling the requirement of Hot water.

Biogas Plant is installed in the Payoshni Girls' Hostel of the college where the waste food from college canteen and the Girls' Hostel kitchen is used as a fuel for biogas.

### **Rainwater Harvesting**

The college ensures rain-water conservation through rainwater harvesting. The rain water from the roof top outlets is carried through the well connected pipelines to the wells or is collected in the large water harvesting tanks and the overflowing rain-water from these tanks is discharged in the soak-pits for ground water recharge.

Both the wells in the college and in the Girl's' Hostel are connected to rooftop rainwater harvesting system and the collected rain-water is discharged to the wells.

Rain water collected in the tank is supplied to the plants in the Medico- Botanical Garden of the college.

The college has established two tanks near the Department of Chemistry for the collection of rain-water which is used for the laboratory use. In addition to this, the overflowing rain water from these tanks is carried to the soak pit for ground water recharge

Excess Water in the Water Harvesting Water Collection Tanks is discharged in the Pit for Groundwater Recharge

### **Biogas**

A Biogas Plant has been installed in the Payoshni Girls' Hostel of the college. It has a capacity of 2000 Ltr. and can produce Methane gas equivalent to 500 gms equivalent of LPG per day. The raw material used for the plant is the waste food from the canteen and the Girls' Hostel Mess. This gas is not explosive as that of LPG, so it is very safe to use. There is no threat of leakage or storage of gas.

## **Paperless Office and Communication: -**

The college has a policy to minimize the use of paper in all types of official/academic communication of the college through E- Communication. **The use of paper is substantially reduced through digitization. One-side blank pages are used to avoid wastage of paper.** All the college staff have been provided the college E-mail IDs and through which they make all the required official and college-related communication. What's app - Class-wise groups, Department wise groups, Committee wise groups have been formed which have reduced the usage of paper in notices and circulars. Moreover, the college has avoided massive usage of paper by introducing the "Learning Management System" wherein references, notes, syllabi, question banks, study material are stored and shared on the e-platform. Some departments have also started accepting E-assignments.

This practice has proved highly beneficial to save money, boost productivity, save space, make documentation and information sharing easier, and help the environment.

## **Environmental Air Quality Monitoring of Amravati City and the Establishment of 'Continuous Ambient Air Quality Monitoring Station'**

Smart cities are expected to be urban spaces that provide a decent quality of life to their citizens by offering a clean and sustainable environment. For a Smart city, it is necessary to monitor the environmental conditions for identifying the sources of pollution and mitigate them. A network of low-cost air quality monitoring sensor nodes can be deployed to monitor the air-quality and meteorological parameters across the city. The city can take corrective measures and improve its environmental health by getting acquainted with the various sources causing pollution in the city. A holistic view can be derived, which enables the authorities to make data-driven decisions for the infrastructure and policy planning.

Environmental Air Quality Monitoring of Amravati city is carried out by the department of Environmental Science of the college. The students pursuing the UG and PG studies are involved in this project and get an opportunity to avail the hand-on training of handling the sophisticated instruments used to measure and analyse the criteria pollutants. They also get aware and cautious about the spread of pollution in the city and can work as effective volunteers to control pollution.

The air quality monitoring was conducted with the help of fine dust sampler. Near about the 3 station were selected for this activity in Amravati city. The stations were selected from the industrial area, commercial area and residential area each. The monitoring was done once in a week (On Tuesdays, Thursdays and Saturdays) at all sampling stations. The sampling was done for a period of 24 hours each and was carried out in the intervals of 8 hours to evaluate the RSPM parameters. Likewise, the monitoring was done in the intervals of 4 hours for the NO<sub>x</sub> and SO<sub>x</sub>. The parameters selected to determine the air quality in these areas are RSPM, NO<sub>x</sub> and SO<sub>x</sub>. The Gravimetric method was used for the determination of RSPM. A Spectrophotometric Method is used to determine and analyse the oxides of carbon, nitrogen and sulphur in the air.

The reports based on the meticulous analysis are submitted to the Amravati Municipal Corporation. The Municipal Corporation uses this submitted data for preparing Environmental Impact Statement (EIS) of the city. The AMC has highly appreciated the college for this innovative project.

#### **Establishment of Continuous Ambient Air Quality Monitoring Station (CAAQMS):**

Taking into consideration the substantial work done by the Department of Environmental Science of the college in propagating environmental consciousness, the Maharashtra Pollution Control Board MPCB requested this college to establish the Ambient Air Quality Monitoring Station in the college campus and accordingly, the college has established- "**Continuous Ambient Air Quality Monitoring Station**" in collaboration with the Regional Office of the MPCB, Amravati.

The "**Continuous Ambient Air Quality Monitoring Station (CAAQMS)** is a facility to measure the air and meteorological parameters (criteria pollutants) continuously all year round. The measured data is remotely monitored and exported in various formats to the local central authorities. The data is published via the Internet for easy public access to raise awareness on current air pollution levels. This way, the public can prevent outdoor activities and reduce health impacts during heavy polluted days.

#### **Solid waste Management**

The Solid waste generated in the campus is segregated as bio degradable and non-degradable and handed over to Amravati Municipal Corporation as a part of Swachh Bharat Abhiyan and "Our Amravati, Clean Amravati"

All the Departments, laboratories, and Classrooms are provided with dustbins for dry wastage disposal. Segregation of the waste into dry and wet waste is done through the separately allotted dustbins at strategic locations in the college.

### **Vermicompost Unit**

Vermicompost Unit is established in the Medico-Botanical Garden of the Department of Botany. The students of the department actively involve themselves to run this unit. The organic waste material is collected from the college campus by the students to deposit it in the special vermicompost tank. Using cow dung, Earthworms the soil mixture is made with appropriate proportions. With the help of students and farmers this mixture is installed in the tank and watered properly for 4-8 weeks. First flush of pure, odorless and granular, soft vermicompost is obtained. Technical protocol and support is provided to the students and farmers in case of mass production.

Vermiwash, a liquid can be obtained from the tank by pipe in case of excessive water. This extension activity of the Botany Department promotes Vermicomposting awareness among the students and the farmers for eco-friendly organic farming.

Apart from the organic waste in the college campus, the raw material for the tank is provided by the "Ecofriends" of the department who collect the used pooja Material like the garlands, flowers, bouquets, etc. in a 'Nirmalya Kalash' during the festivals like Ganeshotsav and Durgapooja and use it for vermicomposting

### **Liquid waste Management**

#### **Laboratory liquid waste management system through percolation system: -**

Two Soak Pits for groundwater recharge are constructed for non-hazardous liquid waste generated from labs. Chemistry laboratory have separate basin marked with hazardous chemical waste. In this liquid waste can be defined as waste water of practical without chemical. This is the liquid used for washing purpose other than reaction. As this liquid is not hazardous to environment so it can be percolate in the soil so as to avoid stagnant water and to facilitate ground water recharge. The hazardous liquid containing chemicals get transfer to Laboratory Hazardous Chemical waste disposal unit. This waste liquid of both laboratories is percolate in to the soil through different water percolation system. This percolation pit is also

like rain water harvesting system The pit is filled with gravel/pebbles followed by river sand for better percolation.

### **Hazardous Chemical Waste Management**

We have planned to minimize the use of hazardous chemicals related experiments Even though during the synthesis if some hazardous chemicals may be form, diluted chemicals are diluted before discarding in wash basin. The basin is Marked for the disposal hazardous chemical waste and all the chemical waste is collected in a separate tank set up outside the laboratory. The chemical effluent is further carried away by the firm SMS ltd., Nandgaon-peth for the treatment. The agreement letter regarding this is signed by the Department for the chemical-free environment of college campus.

### **Water Management**

The water for all other purposes is supplied through another set of distribution pipes. The college has two wells with ample water. The ground water from the wells is pumped into the storage tanks / elevated service reservoirs located at different places in the campus. The water is distributed through well-laid pipe network.

Entire distribution system is well supervised by the college administration to ensure that there are no leakages and wastages of water through Leakages in the pipelines and the water-taps etc. Regular cleaning of the water tanks is regulated by the administrative staff of the college. All the stakeholders of the college are well-educated to use water economically and efficiently

Rainwater from the different college buildings is taken to the wells for ground-water recharge. A proper care is also taken to keep the Rooftops cleaned so that unnecessary garbage does not mix with the rainwater leading towards the well. The inlets of these tanks is controlled by the ball-valves to avoid water overflows.

Apart from carrying out Cleanliness Drives, Awareness Campaigns, the College NSS volunteers also build Earthen Nala Bunds (ENB) for ground water recharge in the adopted villages during the NSS Special Camps.

### **E-waste Management**

E- waste management by the Department of Physics Components and other small devices/parts of non-repairable equipment's are used to fabricate new experimental kits / power supplies. This is one of the best practices of the Physics department.

The department has started reusing the electronic components from the discarded instruments, PCs, UPS, etc. such as transformers, transistors, ICs, Capacitors, Inductors, Resistors, Connectors, Sockets, Switches, Wires, LEDs and other electronic or electrical devices to fabricate the instruments and experimental kits that are used in the Physics Laboratory.

The students and faculty have also involved in the maintenance and repairs of the instruments and experimental kits, which led to increase their life and the optimum uses. This have not only become a step towards the E-waste management but also cultivated innovative ideas among the students and the faculty. The students have also gained many skills through these activities.

### **Donation of Used Computers to Schools**

Our college always take an initiative in reducing the digital divide in the rapidly growing digital world. The e-waste of the college is generally not thrown into garbage. Instead, these unwanted/excess computer machines / devices / printers / scanners / keyboards / mouse etc. are transferred or distributed among all the schools and colleges coming under Shri Shivaji Education Society, Amravati. Every year some computers are donated to the various schools so that the students belonging to rural areas get computers for practicals. This way, our college is serving for the society too.

### **Display Boards to Promote Environmental Sensibility on College Campus**

Various boards including Quotes that promote environmental awareness and ethics including air-pollution control, plastic-free campus, conservation of energy, recycling of resources, tree plantation, Nature conservation, etc. are displayed for all the stakeholders of the college.

### **Installation of Incinerator in the Girls' Common Room**

The college has installed an Incinerator for the disposal of sanitary pads in the Girls' Common Room as a step towards eco-friendly disposal mechanisms.

### **Observance of Days to Protect and Nurture Environment**

The organization of various events like Rallies, Awareness Campaigns, Cleanliness Drives, Seminars, Conferences, Workshops, presentations, Tree Plantation Drives, Wildlife Photography Competitions, Rangoli Competitions, Essay Competitions, Bird Watching Programs, Excursions, Study Tours, Guest Lectures, Talks, etc. on the occasion of various days like- 'International Day for the Preservation of the Ozone Layer' (16 September), 'World Environment Day' (05 June), 'International Tiger Day' (29 July), 'Wildlife Week' (02 to 08 October), 'World Biodiversity Day' (22 May), 'World Wetland Day' (02 February), 'World Water Day' (22 March), 'World Sparrow Day' (20 March), 'Great Backyard Bird Count (GBBC)' (14 February), Mahatma Gandhi Jayanti (02 October), 'Army Day' (15 January) 'Bird Week' in first week of November, etc. ensures to create awareness among young students and public about various environment related problems and conservation of Nature and natural resources in the surrounding area and educating on how to live a Eco-friendly life.

### **The Green, Environmental and Energy Audit**

The Green, Environmental and Energy Audit of the college is done by Shri Shri Enviro Consultancy, Amravati. The initiative regarding this is taken by the Department of Environment Science of the college.

### **Dedicated Section for the Environment Consciousness in a creative Wall Magazine**

Issues pertaining to Environment and Sustainability are addresses through lessons and poems prescribed for the subjects like Compulsory English, Supplementary English, Marathi and Hindi. However, there is a Dedicated Section for the Environment Consciousness in the "Ingenuity- A Students' Space"- a creative wall magazine of the college where the students are promoted to write and display their write-ups regarding environmental sensibility.

In order to create awareness regarding environmental pollution of which disposal of solid waste material is one of the major issues. For this we decided to explain hazards of excessive use of polythene bags and packing materials which causes toxic effects on food materials and

blocks our drainage system, particularly during rainy season. Large scale uses of polythene glasses and plates in marriages and parties have created havoc for animals and birds.