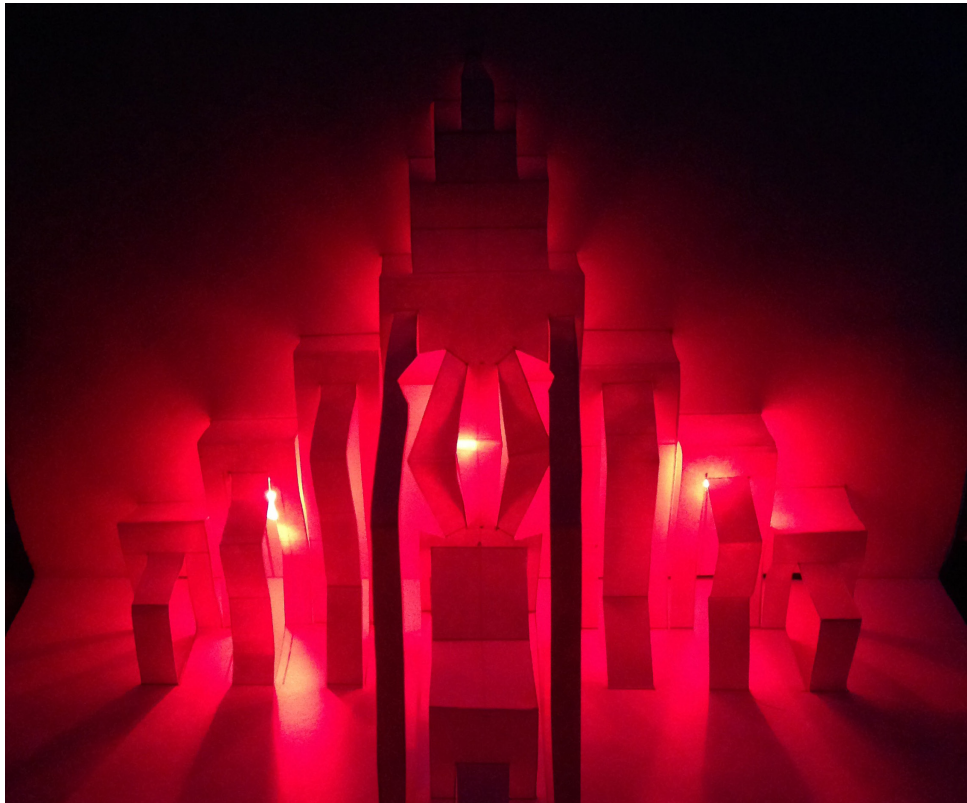


3 Years | Undergraduate Skill-Based Vocational Program | Bachelor of Vocation

## B.Voc. in Creative Coding

**PATHWAYS PHYSICAL COMPUTING**



### FOR FURTHER INFORMATION

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### CREATIVE CODING

The world is moving from a phase where technology changed the way we do things, to a phase where technology is changing what we believe is possible. In this scenario, a creative approach to programming fuels the Creative Coding course at Srishti, which seeks situations where computing empowers - making information accessible where it matters and implementing solutions using available technological resources.

### ELIGIBILITY

Published on the admissions page of the Srishti Manipal website.

### MEDIUM OF INSTRUCTION

English; all our transactions and transcripts will be in English.

### DURATION

6 semesters (3 years); based on the National Skills Qualification Framework (levels 4, 5, 6, 7).

### MODES OF DELIVERY

**THEORY** Master classes, appreciation, lecture-demos, readings

**TUTORIALS** Learning by working on given tasks, interjected with short periods of instruction/demonstration to learn specific techniques or ideas

**MASTER CLASSES** Interactions that could be face-to-face, on Skype or as webinars

**PRACTICAL** Studio settings where students will use techniques and concepts they have learnt to facilitate making, doing and thinking. This learning mode is envisioned as a space for experimenting, synthesizing knowledge and practices through immersive engagement, intuition, contextual learning, design processes and creative methodologies

**FOCUSED AREA STUDY** Specialized learning in a specific aspect of a discipline that has a direct skill based industrial input. Core skills are amplified based on cutting edge industry trends as crystallized through the round table and the mentor labs

**SELF-STUDY SESSIONS** Sessions where documentation, online resources and forums are used to learn specific topics- this could include taking short online courses (when such are available) and working on open-source projects

**PORTFOLIO** Building of a curated collection of work

**PRACTICUM** Work based learning experience

**PROJECTS** Punctuations in a semester, requiring students to work individually or collaboratively towards a real or simulated design brief

**SEMINAR** Students work towards the articulation of a position on the one hand and being sensitive to the position of the other. Seminar is a mode where learners explore a curated - theme, technology, method or innovation through guided interaction with industry experts, professionals or students themselves, in a collaborative mode

**ROUND TABLE** Brings in experts from the industry as keynote speakers, in addition to students who have come in fresh from industry apprenticeship, to create a reflection on how the industry and institution collaborate in order to produce vocation specific learning

**MENTOR LABS** Non-prescriptive by nature, mentors labs enable rather than instruct in different areas such as technical knowhow, innovation and design, leadership and motivation, business and entrepreneurship

**INDUSTRY EXPOSURE** Facilitate building networks and keeping abreast with the developments that are constantly occurring in industry - field visits, trade shows, festivals, symposiums, seminars conferences

**APPRENTICESHIP** Involves working in a professionally mentored environment under a practitioner from the industry such as a master craftsman, designer or artist

**CAPSTONE PROJECT** A compulsory industry-based project situated in a real world production pipeline, focusing on developing industry standard solutions. Students will apply their skills and learning in research, design process, ideation, prototyping, making and testing.

CURRICULUM COMPONENTS	SEMESTER
Theory	1, 2, 3, 4, 5
Tutorial	1, 2, 3, 4, 5
Master Class	1, 2, 3, 4, 5
Practical	1, 2, 3, 4, 5, 6
Self-Study	1, 2, 3, 4, 5, 6
Seminar	2, 4
Focused Area Study	5
Projects	1, 2, 3
Mentor Lab	5
Portfolio	1, 2, 3, 5
Language	1, 2, 3, 4, 5
Electives	1, 2, 3, 4
Holistic Education	1, 2, 3, 4
Practicum	1, 2, 3, 4, 5, 6
Industry Exposure	2
Apprenticeship	4
Capstone	6

**COMMON LEARNING UNITS**

**YEAR 1**

SMVPC01	Elective - 1
SMVPC03	Language - 1
SMVPC05	Project - 1
SMVPC07	Industry Exposure - 1
SMVPC09	Holistic Education - 1
SMVPE01	Portfolio - 1
SMVPC02	Elective - 2
SMVPC04	Language - 2
SMVPC06	Project - 2
SMVPC08	Industry Exposure - 2
SMVPC10	Holistic Education - 2
SMVPE02	Portfolio - 2
SMVPS02	Seminar

**YEAR 2**

SMVPC11	Elective - 3
SMVPC13	Language - 3
SMVPC15	Project - 3
SMVPC17	Apprenticeship - 3
SMVPC19	Holistic Education - 3
SMVPE03	Portfolio - 3
SMVPC12	Elective - 4
SMVPC14	Language - 4
SMVPC16	Project - 4
SMVPC18	Apprenticeship - 4
SMVPC20	Holistic Education - 4
SMVPE04	Portfolio - 4
SMVPS04	Seminar

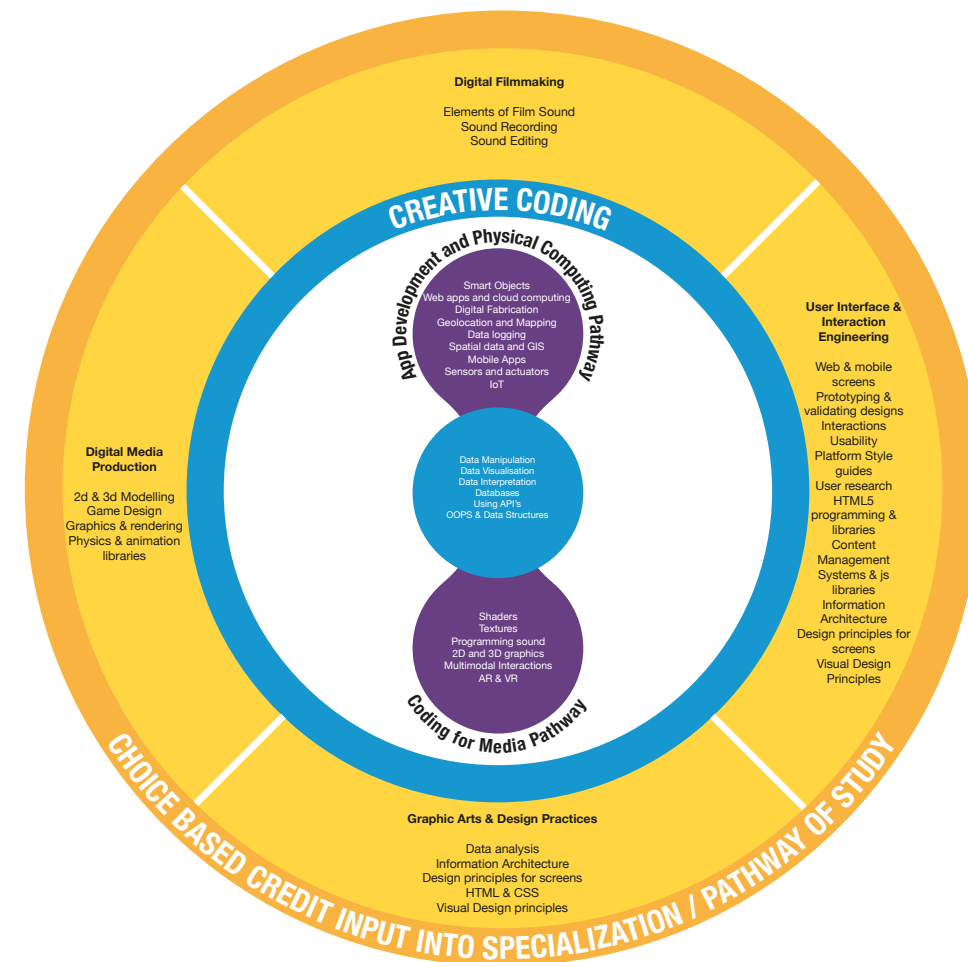
**YEAR 3**

SMVPC21	Language - 5
SMVPC23	FAS - 5
SMVPC25	Mentor Lab - 5
SMVPE05	Portfolio - 5
SMVPC22	Language - 6
SMVPC24	FAS - 6
SMVPC26	Mentor Lab - 6
SMVPE06	Portfolio - 6
SMVCAP6	Capstone

**COURSE AIMS AND OBJECTIVES**

- » To produce creative and technically competent professionals who are reflective and critical about their practice.
- » Develop skills and understanding of the several aspects of programming.
- » Provide a broad exposure to related fields and explore opportunities in these fields that are accessible via computation.
- » Create new tools or extend existing ones and devise techniques to manage & manipulate data / media.

**PATHWAY 1: PHYSICAL COMPUTING**



## PATHWAY 1

### PHYSICAL COMPUTING

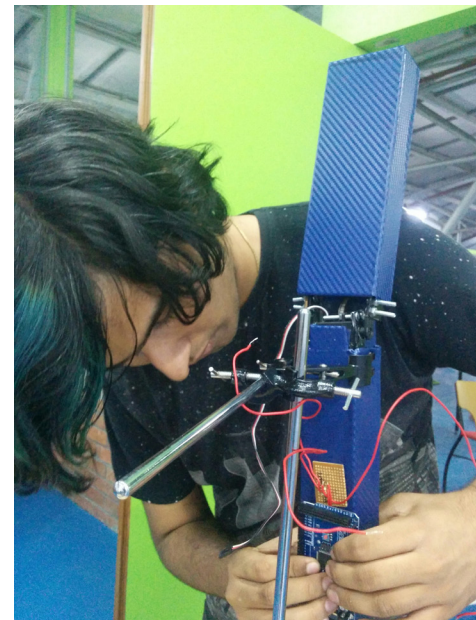
This pathway - App Programming and Physical Computing will focus on:

**App development:** Develop web and mobile apps in a variety of situations and build appropriate features (such as content management, e-commerce, media viewing etc.) depending on requirements. This would involve both client and server side work.

**Physical computing:** Involves working with and programming microprocessors (combined with appropriate sensors / actuators) to design and make objects. Networking such objects so that they are able to 'talk' to each other is an emerging field, and the ubiquity of these seems certain in the near future. Such objects could be used to do specialized jobs like data-logging or automation, or to build exhibits and installations.

An example of an area where applications of this sort are rapidly growing is in Education: In this area, graduates of this pathway can work in a number of roles such as building platforms for young people to interact and learn designing and planning activities which help learners to code and use technology evaluate and set-up infrastructure that works in an educational set-up (often where there are constraints on resources)

LEARNING UNITS		EXIT CRITERIA
<b>YEAR 1</b>		<b>At the end of year 1 students will:</b>
SMCC125	Command Line Basics	<ul style="list-style-type: none"> <li>» Be able to use basic programming constructs and structures including classes and databases.</li> <li>» Find and use libraries/modules as required (after evaluating options to find the best choice) to code software</li> <li>» Be familiar with the modalities of setting up a system based on Linux and installing software on it, taking care of dependencies</li> <li>» Build web pages and code for the web.</li> </ul>
SMCC127	Introduction to Programming (I - Basics)	
SMCC129	Introduction to Programming (II - Data Structures and Classes)	
SMCC131	Introduction to Creative Coding	
SMCC126	Coding for the Web	
SMCC128	Math for Programming	
SMCC130	Handling Data	
<b>YEAR 2</b>		<b>At the end of year 2 students will:</b>
SMCC225	Physical computing	<ul style="list-style-type: none"> <li>» Be familiar with a variety of contexts in which data can be manipulated computationally including GIS and spatial data and 2d /3d modelling.</li> <li>» Understand the basics of programming microcontrollers and using sensors and actuators to interact computationally with the physical world.</li> <li>» Be able to exploring data from the point of view of analytics and visualization.</li> <li>» Appreciate the principles of mathematics and statistics such as regression and probability that are used in applications of coding.</li> </ul>
SMCC227	Introduction to Spatial Data and Geolocation	
SMCC229	Introduction to Programming for Mobile Devices	
SMCC226	Extending Functionality – APIs and Scripting	
SMCC228	Introduction to Digital Fabrication	
SMCC230	Working with Sound	
SMCC232	Cross Platform Game Design and Development	

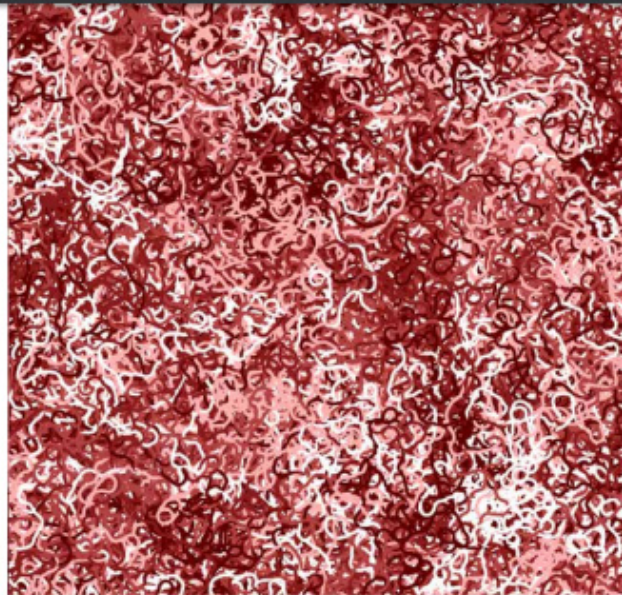


### YEAR 3

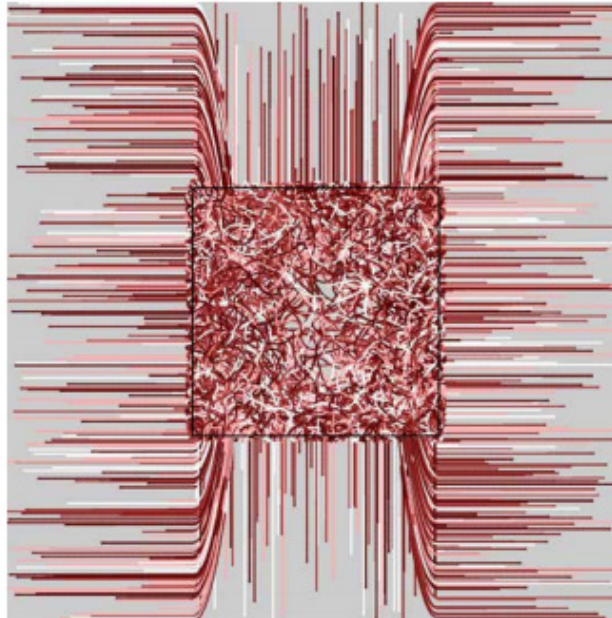
SMVPC23	FAS - 5
SMVPC25	Mentor Lab - 5
SMVCAP6	Capstone

#### At the end of year 3 students will:

- » Have formulated and executed a select process or a project
- » Have applied investigative thinking and developed project managerial skills.
- » Have taken a project from the drawing board to the finished outcome in showcasing individual expertise in a chosen area of practice.
- » Have specialized in an area in creative coding of their interest
- » Have designed a capstone either as an individual or a collaborative project.
- » Be equipped to do self-driven individual work and be able to perform as application developers who can create new applications or extend existing ones in the field of creative coding.



Agents Test-4. This image was generated due to the application of the randomness behaviour on 1000 vehicles.



**Fig 49:** Image generated from Experiment Autonomous Agents Test-6. This image was generated due to the application of the randomness and stay in boundary behaviours on 1000 vehicles.

**For more information on the programs and courses**

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