



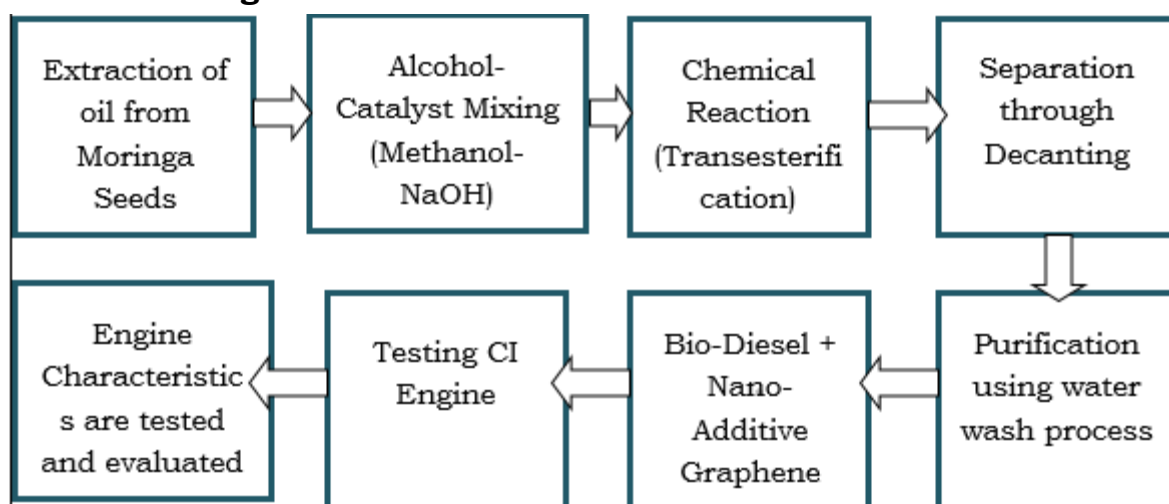
**KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY**  
*Indian Institute of Science campus, Bengaluru*

**FORMAT FOR STUDENT PROJECT PROPOSAL FOR THE  
44<sup>th</sup> SERIES OF STUDENT PROJECT PROGRAMME**

1.	<b>Name of the College :</b> DAYANANDA SAGAR COLLEGE OF ENGINEERING
2.	<b>Project Title:</b> “Impact of Nanoparticles as an Additive in Biodiesel Under Varying Loads and Compression Ratios on the Working Characteristics of A Compression Ignition Engine”
3.	<b>Branch:</b> MECHANICAL ENGINEERING
4.	<b>Theme (as per KSCST poster):</b> -Bioenergy / Solar energy application at villages.
5.	<b>Name(s) of project guide(s) :</b> Name : Mr. Mohan Das A.N Email id : <a href="mailto:mohandas-me@dayanandasagar.edu">mohandas-me@dayanandasagar.edu</a> Contact No.: +91 9739166636
6.	<b>Name of Team Members (Strictly not more than four students in a batch):</b>  Name: ADITYA KAMATH USN No.:1DS17ME008 Email id: <a href="mailto:adityakamath123@gmail.com">adityakamath123@gmail.com</a> Mobile No: 9342449828  Name: BHARGHAVA R RAJU USN No.:1DS17ME027 Email id: <a href="mailto:bharghavaraju17@gmail.com">bharghavaraju17@gmail.com</a> Mobile No.:9902532484  Name: JATIN S USN No.:1DS17ME047 Email id: <a href="mailto:jatinsiddesh@gmail.com">jatinsiddesh@gmail.com</a> Mobile No.:9008211182

	<p><b>Name: SHREYAS N</b>  <b>USN No.: 1DS17ME120</b>  <b>Email id: shreyasnagaraj95@gmail.com</b>  <b>Mobile No.: 7406456471</b></p>
<b>7.</b>	<p><b>Team Leader of the Project :</b>  <b>Name: SHREYAS N</b>  <b>USN No.:1DS17ME120</b>  <b>Email id:shreyasnagaraj95@gmail.com</b>  <b>Mobile No.:7406456471</b></p>
<b>8.</b>	<p><b>Processing Fee Details (Demand Draft should be drawn from Canara Bank / State Bank of India only):</b></p> <p><b>Demand Draft No.: 589463</b>  <b>Date: 30/11/2020</b>  <b>Bank name: State Bank of India</b></p>
<b>9.</b>	<p><b>Date of commencement of the Project :</b>  <b>1<sup>st</sup> November,2020</b></p>
<b>10.</b>	<p><b>Probable date of completion of the project :</b>  <b>30<sup>th</sup> April,2021</b></p>
<b>11.</b>	<p><b>Scope / Objectives of the project:</b></p> <ul style="list-style-type: none"> <li>• <b>To investigate the novel biodiesel and nano additive emulsified fuel to the existing diesel engine.</b></li> <li>• <b>To create the demand for selected crude oil, which will help to grow the economic condition of the farmer</b></li> <li>• <b>To enhance the properties of biodiesel by dispersion of nanoparticles.</b></li> <li>• <b>To optimize the compression ratio for the existing diesel engine concerning performance, emissions, and combustion attributes.</b></li> <li>• <b>To optimize the adequate nanoparticle proportion with biodiesel concerning performance, emission, and combustion characteristics.</b></li> <li>• <b>To improve fuel quality and enhance the thermal brake efficiency by reducing emissions.</b></li> </ul>
<b>12.</b>	<p><b>Methodology:</b>  To achieve the above objectives, the following are the methodology will be adopted in the present work:</p> <p><b>1. Selection of suitable biodegradable fuel as a substitute for diesel fuel.</b></p>

2. **Generation of Bio Diesel from selected crude oil by Transesterification process.**
3. **The oil has to be blended with different proportions of Nanoparticle additives, and four batches of fuel are acquired to test the most efficient one.**
4. **Characterization of the biodiesel and its blend**
5. **Engine Test analysis - Run the engine with fuel samples prepared in the previous stage by varying the load and compression ratio.**
6. **Study of performance, combustion, and emissions characteristics of a C.I. engine with selected fuel samples to optimize the better fuel proportions and Compression ratio for the conventional diesel engine.**



**13. Expected Outcome of the project:**

- **The obtained biodiesel after transesterification will meet the ASTM standards as that of diesel fuel.**
- **The selected fuel and nano additive will become a novel combination of fuel for the existing engine.**
- **The selected fuel samples will enhance the performance and combustion attributes by reducing harmful emissions.**
- **The varying compression ratios also will perform without affecting the engine.**

14.	<p><b>Is the project proposed relevant to the Industry or Institution? :</b></p> <p><b>Yes / No : NO</b></p> <p><b>If Yes, Please provide details of the Industry / institution and contact details :</b></p> <p>(<b>Note:</b> Preference will be given to those projects relevant to the industry / institution. Hence be specific in giving detailed information). Is the industry extending support - technology / funds / use the final product, please specify.</p>														
15.	<p><b>Can the product or process developed in the project be taken up for filing a Patent?</b></p> <p><b>Yes / No : NO</b></p> <p><b>Prior Art search done?</b></p> <p><b>Yes/No : NO</b></p> <p><b>Note:</b> If Yes, you may contact Patent Information Centre of KSCST for more details Email : <a href="mailto:patent@kscst.iisc.ernet.in">patent@kscst.iisc.ernet.in</a></p>														
16.	<p><b>Budget details (break-up details should be given) :</b></p> <table border="1" data-bbox="405 1115 1265 1648"> <thead> <tr> <th>Budget</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td>a) Materials / Consumables</td> <td>Rs.20,000/-</td> </tr> <tr> <td>b) Labor</td> <td>Rs.3,000/-</td> </tr> <tr> <td>c) Travel</td> <td>Rs.2,000/-</td> </tr> <tr> <td>d) Report</td> <td>Rs.1,000/-</td> </tr> <tr> <td>e) Miscellaneous</td> <td>Rs.5,000/-</td> </tr> <tr> <td><b>Total</b></td> <td><b>Rs.31,000.00/-</b></td> </tr> </tbody> </table>	Budget	Amount	a) Materials / Consumables	Rs.20,000/-	b) Labor	Rs.3,000/-	c) Travel	Rs.2,000/-	d) Report	Rs.1,000/-	e) Miscellaneous	Rs.5,000/-	<b>Total</b>	<b>Rs.31,000.00/-</b>
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17.	<p><b>Any other technical details (Please specify) :</b></p> <p>In this study, <b><u>Moringa oleifera</u> and <u>Graphene nanoparticle</u></b> has been selected based on the following observations:</p> <ul style="list-style-type: none"> <li>It has been observed from the previous KSCST –SPP proposals that the biodiesel and nanoparticle selected in this project work are new and is not used until today as a <b>combination of biodiesel and nanoparticle at different proportions.</b></li> <li>Moringa oleifera oil <b>gives significant properties</b> as compared to previously used biodiesels.</li> </ul>														

- Emulsification of nano additives into the selected biodiesel will reduce the emissions without compromising the performance and combustion attributes.

Application of the project :

1. Industry
2. Agriculture
3. Societal
4. Education / Academic
5. Biofuel industry
6. Automobile
7. Energy/fuel

Description:

- **The selected biodiesel can be utilized as a fuel in diesel motor**
- **Creating household biodiesel industries in the rural area which leads to rural development and agriculture benefits.**

The selected graphene nano additive (GNA) properties and the specification of the device used for emulsification of biodiesel with GNA are portrayed in Table 1 and 2.

**Table 1.** Desirable properties and specification of GNA

Parameter	Value
Thermal Conductivity	3000 watts/m-k
Tensile Modulus	>1000 GPa
Electrical conductivity	$10^7$ Siemens/m
Purity	>99 %
Thickness	5-10 nm
Length	5-10 microns
Density	3.1 g/cm <sup>3</sup>
Number of layer	Average number of Layer 4-8
Surface area	200-210 m <sup>2</sup> /g

**Table 2.** Technical Specification of Ultrasonicator

Parameters	Specification
Model	MX50SH 0.7LQ
Volume Size (L)	0.7
Tank Internal Dimension L x W x D (mm)	152x87x65
Operation Frequency (khz)	40
Ultrasonic Power (W)	50
Heating	✓
Drainage Valve	NA
Carrying Handle	NA
Unit Weight (kg)	1.8
Carton Size (cm)	48x47x43

18.	<p><b>SPP Coordinator (Identified by the college) :</b></p> <p><b>Note:</b> To be identified by the principal of the institution. The project proposals must be submitted to KSCST through SPP coordinator designated by the Principal.</p> <p><b>Name: Dr. C. M. Joseph</b></p> <p><b>Email id: <u><a href="mailto:hod-physics@dayanandasagar.edu">hod-physics@dayanandasagar.edu</a></u></b></p> <p><b>Contact No.: +91 9741913601</b></p>
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**Mohan Das A.N**

**(Name & Signature of Project Guide with Seal)**

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**Contact No.: +91 9739166636**

**Dr.R.Keshavamurthy**

**(Name & Signature of HOD with Seal)**

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**Contact No.: +91 9886252095**

## **DECLARATION**

**(From Project Students)**

We, the project team hereby declare that the details enclosed in the project proposal are true and correct to the best of our knowledge and belief and we undertake to inform KSCST of any changes therein in the project tile, students name will be intimated immediately. In case any of the above information is found to be false or untrue or misleading, we are aware that we may be held liable for it. We hereby authorize sharing of the project information with this project proposal with the Karnataka State Council for Science and Technology, Bangalore.

We are aware that the project team has to exhibit / demonstrate the project in the nodal centre and interact regarding project with the experts and to exhibit the project in the State Level Seminar and Exhibition (if selected). If the student team fails to attend the evaluation in nodal centre or fails to attend the State Level Seminar and Exhibition, the supported project amount will be returned back to KSCST.

We also hereby, enclose the endorsement form to KSCST, Bengaluru.

### **Name of the students**

- 1. ADITYA KAMATH**
- 2. BHARGHAVA R RAJU**
- 3. JATIN S**
- 4. SHREYAS N**

### **Signature with date**

## ENDORSEMENT

(From College, endorsement to be taken in the institution / Department Letter head)

This is to certify that 1) Mr. **Aditya Kamath**, 2) Mr. **Bharghava R Raju**, 3) Mr. **Jatin S**, 4) Mr. **Shreyas N**, are bonafide student(s) of Department of **Mechanical Engineering**, in the degree program of our institution. If the project proposal submitted by these students under the 44<sup>th</sup> series of Student Project Programme is selected by KSCST, we will provide the requisite laboratory / Computer / infrastructure support in our college / Institution. Further we also take necessary steps to see that the project team will exhibit / demonstrate their project in the nodal centre and in the State Level Seminar and Exhibition (if selected). If the student team fails to send the completed project report or fails to attend the evaluation in nodal centre or fails to attend the State Level Seminar and Exhibition, the supported project amount will be returned back to KSCST.

**Mohan Das A.N**  
(Name & Signature of  
Project Guide with Seal)

(Signature of HOD with Seal)

(Signature of the Principal  
with Seal)

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