

5
United Telecoms Ltd. (UTL),
Bangalore

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (MOU) is entered into on this 15th day of September, 2003 between Visveswaraiah Technological University (VTU), an Indian University having its principal office at Belgaum AND United Telecoms Limited (UTL), having its Registered Office at 18A/19, Doddanekundi Industrial Area, Mahadevapura Post, Bangalore-560048.

VTU and UTL are collectively referred to hereinafter as "the Parties".

I. Background:

Visveswaraiah Technological University (VTU) was established in the year 1998 and offers higher education in engineering and technology relevant to the current and projected needs of the society. Promotes research and disseminates knowledge gained there from, and fosters cooperation between academic and industrial communities. The university and affiliated colleges offer a large number of Undergraduate, Postgraduate and Doctoral Programs in various disciplines. In addition to the academic programs, VTU offers continuing education programs as short-term day and evening courses, summer and winter schools on topics of current interest conforming to the needs of national development activities. VTU is the singular affiliating university for all the engineering colleges in the state of Karnataka (currently numbering 113) and is responsible for the curriculum development, examination and teaching standards in these institutions.

The UTL Group is a 2-decade old US\$100 million multi-technology, multi-unit conglomerate, engaged in design, manufacturing and software development in the fields of Telecom (all sectors – including cellular, RF and microwave), Networks, Systems Integration, Software Solutions, PCB Manufacture, Microelectronics Design, Precision Engineering, Plastic Tooling and Moulding, Electrical Stampings and Laminations, Die-casting, Mechanical Fabrication etc. The Group is headquartered at Bangalore and has 10 units located in Bangalore, Hyderabad and Coimbatore, with an office at New Delhi, as also an office in USA. The Group units are ISO 9001 certified and have contemporary design infrastructure, software development environment.

United Telecoms Limited (UTL) has a strong R & D team (Team UTL) of experienced and innovative personnel for research, development and product design covering the entire spectrum of telecommunication (access,

transmission, switching, process control and networking). UTL has emerged as a leading manufacturer and supplier of electronics covering all sectors of Telecom, turnkey execution of major Wide Area Networks, Systems integration & software solutions projects, GSM & CDMA cellular systems planning and execution etc.

United Microelectronic Solutions Ltd. (UMSL) is a state of art design house for VLSI, System on Chip (SoC), and many other semiconductor designs. Design services offered are in analog, RF, mixed-signal and digital areas. UMSL is also equipped to implement value added services through substitutions and re-engineering.

United Technologies (UT) is to bridge the gap between the academic and Industry with the support of UTL Group. United Technologies has been providing expertise to train young people in the realm of emerging technologies, particularly in the areas of Web Technologies, Embedded Systems, VLSI Design, DSP, Wireless Technologies, Networking and Telecom.

VTU and UTL recognize the capabilities and resources that each party possesses, and agree to use their best efforts to bring together those capabilities and resources and the technical expertise of each other in furtherance of their respective objectives:

II. VTU's objectives:

1. ***Faculty Development***
VTU is keen to equip its faculty members with the knowledge and skills on the latest technologies in the field of Electronics, VLSI Design and Embedded Systems.
2. ***Curriculum Development and students training***
VTU would like to offer curriculum based on state-of-the-art technology so that its students are prepared to meet the demands of industry when they graduate.
3. ***Research and development***
VTU would like to enter into collaborative research with industries.
4. ***Industry and Academia linkages***
VTU would like to provide practical exposure to faculty and students to the real life requirements.

5. ***Continuing Education Programs***

VTU would like to provide opportunities for professionals and other knowledge seekers, structured continuing education programs reflecting the state-of-the-art technologies in collaboration with industries.

III. UTL's Objectives:

1. ***Faculty Development***

UTL would like to ensure that faculty members in the field of Electronics, VLSI Design and Embedded Systems have access to its latest technologies in VLSI Design and Embedded Systems and they are able to guide and support their students in these latest technologies.

2. ***Curriculum Development***

UTL being a global technology leader in the field of Electronics, VLSI Design and Embedded Systems it is UTL's endeavour to ensure that the latest technology is available to VTU in its curriculum.

3. ***Learning Packages and Training Programs***

UTL would like to offer short-term day and evening courses and long-term Diploma programs to the working professionals and other knowledge seekers in the emerging areas of Electronics, VLSI Design and Embedded Systems in collaboration with academic institutions.

4. ***Student technology support***

Today's students are tomorrow's professionals and therefore UTL would like to support programs that ensure students are best prepared to meet the professional challenges.

5. ***Research and development***

Undertake collaborative research and development projects with VTU

IV. In furtherance of the above listed objectives of VTU and UTL the Parties now agree to the following:

1. a) VTU will conduct its Part-time M. Tech. courses in VLSI Design & Embedded Systems in the premises of UTL starting with the academic year 2003-2004. The course will be a course conducted by VTU in its extension centre at UTL.

b) The students for the course will be selected by VTU as per the procedure laid down by the university.

- c) The scheme of studies and examination will be as decided by the University from time to time.
- d) After successful completion of the course the students will be awarded the PG Degree Certificates by the university.
- e) The Director of UTL or his nominee will act as a coordinator for the course.
- f) The resource persons (persons handling theory and laboratory classes) and other technical and non-technical supporting staff will be compensated by the University as per the rates fixed by the University from time to time.
- g) UTL will be paid for providing infra-structural facilities like classrooms, laboratories, library space and such other things required for conducting the course.
- h) The details of the remuneration for resource persons and payment for infra-structural facilities etc. prevailing at present will be as follows:

GUIDELINES

i) Remuneration per subject @ Rs. 400/- per hour:

1st & 3rd sem: Rs. 20,000/- per subject inclusive of tutorials

ii) Chief Co-ordinator's (Principal's) fee:

1st sem: Rs. 5,000/- for the 1st course and additional Rs. 1,000/- for each course (PT & FT)

3rd sem: Rs. 3,000/- for the 1st course and additional Rs. 500/- for each course (PT & FT)

iii) Coordinator (HOD):

1st sem: Rs. 2,000/- per course (PT or FT)

3rd sem: Rs. 1,000/- per course (PT or FT)

iv) Office + Library Staff:

- 1st sem: Rs. 8,000/- for the 1st course and additional Rs. 1,000/- for each Part-time and additional Rs. 2,000/- for each Full-time course
- 3rd sem: Rs. 4,000/- for the 1st course and additional Rs. 500/- for each Part-time and additional Rs. 1,000/- for each Full-time course

v) Seminars / Workshops:

- 1st sem: Rs. 5,000/- per Full-time course Rs. 3,000/- per Part-time course
- 3rd sem: Rs. 5,000/- per Full-time course Rs. 3,000/- per Part-time course

vi) Lab staff (Teaching + Non-teaching):

- 1st sem: Rs. 10,000/- per Full-time course Rs. 5,000/- per Part-time course

vii) Contingencies:

- Rs. 65,000/- per Full-time M.Tech course. Rs. 45,000/- per Part-time course

viii) Project / CEL:

- Internal Project: Rs. 2,500/- for Teaching Staff, Rs. 500/- for Non-teaching Staff per M.Tech Project
- External Project: Rs. 500/- for Teaching Staff per M.Tech Project / CEL

ix) Books: Rs. 1,00,000/- per course (or Actuals)

x) Software: Rs. 2,00,000/- per Full-time course (or Actuals)
Rs. 1,00,000/- per Part-time course (or Actuals)

Note: These rates will be in force till such date the Parties deem fit to change with mutual consent.

2. Offer Continuing Education Programs in the premises of UTL leading to
 - a) Certificate courses of duration varying from 2 weeks to 12 weeks on current topics in the field of VLSI Design and Embedded Systems etc.
 - b) One year PG Diploma courses.These programs will be taken up on the basis of mutually agreed terms and conditions.
3. Undertake joint Research & Development projects in furtherance of the objectives of the Parties.
4. Provide mutual assistance/guidance in evolving state-of-the-art curricula in the concerned fields.
5. Provide facilities for the students of VTU to undergo training and to undertake projects on terms and conditions mutually agreed.

V. Intellectual Property

Title to the intellectual property rights of the technologies furnished by UTL will at all times remain proprietary to UTL

VI. Limitation Of Liability

- a. Under no circumstances either party will be liable for the other party's loss of or damage to records or data, as also claims for special, incidental, or indirect damages or for any economic consequential damages (including loss of profit or savings) even if the latter is informed of its possibility. UTL is not liable for loss of profits, business interruption, loss of business information, economic loss or any other indirect, incidental, consequential or special loss or damage, even if the loss or damage was caused, or contributed to, by UTL's negligence; and
- b. UTL's total liability for any other damage is limited to the amount actually paid to VTU by UTL in respect of specific Project/ Projects .

VII. Term and Termination

This MOU will commence from the effective date on which the parties have signed this agreement and will continue to be in force for a period of two years. Either party may terminate this MOU at any time with 30 days prior written notice to the other party, with or without cause, and without liability of any kind to the other party, provided such termination does not harm the interest of the enrolled students and trainees. Upon termination of this MOU, each Party agrees to return all properties (e.g. Content, technology, software, documentation etc.) owned by the other party or to which some other party is entitled.

VIII. Right to Use Name/ Public Announcements

Neither party may use the name, trademark, logo of the other party as a reference in negotiations with third parties; or in press releases or other public notifications, except with the prior written consent of the other party or to the extent required by applicable law.

IX. Non-exclusivity

This MOU is non-exclusive and the parties shall be free to enter into agreements with other parties covering cooperation on technologies and products within the scope of this MOU.

X. Confidentiality

VTU and UTL shall keep confidential the terms and conditions of this MOU, and other information disclosed during the course of the parties cooperation under this MOU.

XI. Legal Effect

This MOU is legally binding on the parties.

XII. Governing Law

The laws of the Indian Union shall govern the validity and interpretation of this MOU.

XIII. Assignment

Neither party may assign its rights under this MOU without obtaining the prior written consent of the other party.

XIV. Amendments or modifications

No amendments or modification to this MOU may be made except by as agreed in writing by both the Parties.

XV. Notices

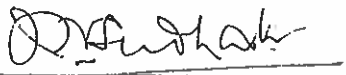
All notices required to be given under this MOU shall be in writing and may be served in person, sent by pre-paid mail to the Party's address as set out in this MOU or sent by facsimile or electronic mail to the number or address as specified by the other party.

The Parties have set their hands to this MOU on the date and day above written, which is the effective date of commencement.

By signing this MOU,

I also confirm that I am authorized to sign on behalf of

VISVESWARAIAH TECHNOLOGICAL UNIVERSITY

By: 
(Signature)

Name: Dr. HV Sudhakar Nayak
Title: Registrar
Email: vtub@hotmail.com

For UNITED TELECOMS LIMITED

By: 
(Signature)

Name: Dr. C. Kasarabada Rao
Title: Group Chairman
Email: crao@utlindia.com



②

Honeywell

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (this 'Understanding') is executed on 7th day of August 2006 by and between **Visvesvaraya Technological University**, having its registered offices at "Janana Sangama", Belgaum- 590 014, Karnataka (hereinafter referred to as 'VTU' which expression shall, unless repugnant to the subject or context thereof, be deemed to include and mean its nominees, successors and permitted substitutes or assigns) of the **ONE PART**

WITH

Honeywell Technology Solutions Lab. Pvt. Ltd. a wholly owned subsidiary of Honeywell Inc., one of the world's premier global and progressive companies having its registered office at 151/1, Doraisanipalya, Banerghatta, Road, Bangalore. (Herein after referred as 'HONEYWELL' or 'HTSL' which expression shall, unless repugnant to the subject or context thereof, be deemed to include and mean its nominees, successors and permitted substitutes or assigns) on another PART either or both of which may be referred to as a "Party" or the "Parties," respectively as the context demands.

WHEREAS

- A. HONEYWELL is a company with excellent achievements in the field of Avionics and desires to take services in the academic advancement in Avionics under the jurisdiction of VTU.
- B. VTU is committed *inter alia* to promoting and developing higher education and with a view to provide an opportunity to working employees to obtain education, expertise and qualification in the engineering sector, VTU has agreed to such request, on the terms and subject to the conditions contained herein.
- C. Based on the complementary strengths of Honeywell and VTU, VTU is desirous of establishing an extension centre at HONEYWELL (Herein after referred as "Centre"), which would provide Post graduate education and Research programs as set out in Annexure 1 attached hereto

DEFINITIONS

In this Understanding, unless the context otherwise requires, the following expressions shall have the meanings assigned to them below:

1. 'Applicable Laws' mean the central, state and local laws of India including the rules, regulations and guidelines issued by any Government, regulatory, executive and judicial and other statutory authorities, the regulations of the University Grants Commission and Distance Education Council and other guidelines.
2. 'Courses' mean the courses associated with Master's/Research as listed in Annexure-1 hereto.
3. 'Course Material' refers to the material (whether or not in printed, electronic, audio-visual or multimedia form) relating to the Course, supplied by VTU, for provision to the students.
4. 'Course Curriculum' refers to the curriculum of each of the Courses furnished by VTU.

NOW THIS MOU WITNESSETH AS FOLLOWS THE ROLES AND RESPONSIBILITIES OF EITHER PARTY



Roles and Responsibilities of VTU

1. VTU shall arrange for the courses to be conducted at the Centre at HONEYWELL by VTU identified faculty that includes also in-house and visiting faculty members drawn from Academia and Practicing Managers. All theory/Theory/Practical classes in relation to the course as per annexure 1 shall be conducted at the Centre.

1. VTU shall also arrange to appoint a course coordinator who shall be available at the Centre where the course is being offered in order to facilitate proper coordination between VTU and Honeywell covering all aspects relating to conduction of classes, examination, payment to identified resource personnel and all other activities coming within the ambit of conducting such courses. Payment to the course coordinator and resource personnel shall be undertaken by the University.
2. All students shall be governed by the academic regulations framed by VTU, which shall be provided by VTU to the students at the start of the Course.
3. VTU shall arrange for the examination and other assessment systems for the evaluation of the students. Assessment of the students shall be solely carried out by VTU.
4. VTU shall maintain both in a physical as well as in an electronic format (wherever possible or available), the details (including academic records) of all Honeywell sponsored students enrolled for the Courses and shall provide the same to Honeywell on request.
5. Award certificates and details of Student performance in the form of a transcript shall be issued only by VTU. Students who have successfully completed the full Course, as assessed by the assessment board of VTU shall be eligible to receive the degree certificate. .

Roles and Responsibilities of Honeywell

1. HONEYWELL shall ensure that necessary facilities are provided for theory/practical training for the smooth and efficient functioning of the Centre
2. HONEYWELL is entitled to sponsor those of its employees, who fulfil the eligibility requirements of VTU and selected by VTU for the course.
3. HONEYWELL undertakes to strictly follow the Course Curriculum and the teaching plan approved by VTU.
4. HONEYWELL agrees to pay the fees set out in Annexure-2 to VTU for the students sponsored by it.

Term, Termination and Liability

This Understanding shall come into force and take effect from the date first written above and shall be valid for a period of Five (5) years and may be renewed thereafter by the Parties upon mutual consent.

This Understanding may be terminated by either Party by providing 60 (sixty) days written notice to the other Party, before the beginning of the academic year, and the termination would be effective at the end of the notice period.

Any termination of the Understanding shall be on the understanding that students who have already enrolled in any of the Courses as at the date of termination shall remain entitled to complete their respective Courses and be eligible to appear for the assessment / examinations conducted to obtain an award. The obligations of the Parties shall continue to be in force during such period, notwithstanding any termination of the Understanding.



Honeywell

Miscellaneous

A Coordination Committee consisting of the following would coordinate and monitor the academic and research programs and all related operational details.

- | | |
|-------------------------------------|--------------|
| 1. Vice Chancellor / Registrar, VTU | Chairman |
| 2. Managing Director, HTSL | Co- Chairman |
| 3. Two Nominees of VTU | Members |
| 4. Two Nominees of HTSL | Members |

Any variation or amendment or addition of/to this Understanding shall be mutually agreed to in writing and executed by or on behalf of each of the parties, VTU and HONEYWELL. Any variation/modifications/changes in Annexure 1, and Annexure 2, shall be mutually agreed upon and effected by altering the respective annexure duly signed by the parties.

This Understanding represents the entire Understanding as to the subject matter hereof and supersedes any prior understanding between the parties on the subject matter hereof.

IN WITNESS WHEREOF, the parties hereto have executed this Understanding as of the date first above written

Signed for and on behalf of
Visvesvaraya Technological University, Belgaum

Signed for and on behalf of
Honeywell Technology Solutions Lab. Pvt. Ltd, Bangalore

Dr. M.S. Shivakumar
Registrar

Dr. Krishna Mikkilineni
Managing Director

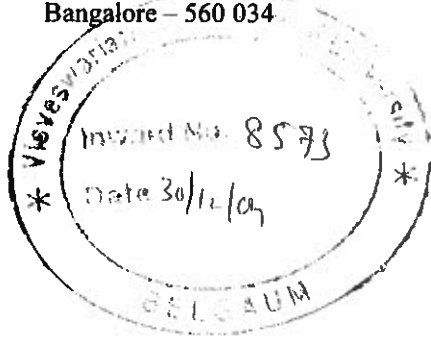
Witnesses:

Dr. K. Venkatesh
Special Officer
VTU, Bangalore

Mr. Joshi
Head, Aerospace Div.
HTSL, Bangalore

KARNATAKA STATE REMOTE SENSING APPLICATIONS CENTRE

Department of IT and Biotechnology, Government of Karnataka
17 Party Building, Survey of India Campus, Sarjapur Road, Koramangala II Block
Bangalore – 560 034



KRSAC/OFF/SFT/12/2004

December 18, 2004

Dear Sir,

This is to bring to your kind information that we have shifted our office from the present premises (KSCMF Building, Cunningham Road, Bangalore) to the Survey of India Campus, Bangalore. Our new address is as follows:

Karnataka State Remote Sensing Applications Centre (KRSAC)
Survey of India Campus
Karnataka Geospatial Data Centre
Koramangala II Block
Sarjapur Road
Bangalore – 560 034

Phone: 080-25634988
Fax: 080-25634897


Hence, all future correspondence may kindly be sent to the above said address.

With kind regards,

Yours faithfully,


Director, KRSAC

Prof. M S Shivakumar
Registrar
Visvesvaraya Technological University
Belgaum – 590 014

NK/A5

29/12/04.

KARNATAKA STATE REMOTE SENSING APPLICATIONS CENTRE

Department of IT and Biotechnology, Government of Karnataka
17 Party Building, Survey of India Campus, Sarjapur Road, Koramangala II Block
Bangalore – 560 034

KRSRAC/OFF/SFT/12/2004

December 18, 2004

Dear Sir,

This is to bring to your kind information that we have shifted our office from the present premises (KSCMF Building, Cunningham Road, Bangalore) to the Survey of India Campus, Bangalore. Our new address is as follows:

Karnataka State Remote Sensing Applications Centre (KRSRAC)
Survey of India Campus
Karnataka Geospatial Data Centre
Koramangala II Block
Sarjapur Road
Bangalore – 560 034

Phone: 080-25634988
Fax: 080-25634897

With kind regards,

Yours faithfully,


Director, KRSRAC

Dr K Balaveera Reddy
Vice Chancellor
Visvesvaraya Technological University
Belgaum – 590 014

Registered
29/12/04

NK
30/12/04



Visveswaraiah Technological University

K.L.E. Hospital Campus, Nehrunagar
Belgaum 590 010. (Karnataka State)

Phone: (O): (0831) 472500

Fax : (0831) 472501

Ref.No. VTU/2001-2002/ 3253

Date : 08-08-2001

To,

Dr. H. Honne Gowda,
Director, KRSAC,
No.8, Ground Floor,
MSB III Block, KSCMF Ltd. Bldg.,
Cunningham Road,
BANGALORE - 560 052.

Sir,

Sub : Release of Grants for initiating DRS - ITP programme - reg.
Ref : Your letter No.KRSAC/VTU-DRS-ITP/2001, dt :24-7-2001.

We are in receipt of your above cited letter regarding releasing of grants for initiating DRS - ITP programme. I am directed to state that our Vice Chancellor had discussed with the principals of all the engineering colleges in Karnataka which are affiliated to this University. These colleges number more than 100. The Vice Chancellor has requested each college to contribute Rs.25,000/- towards DRS - ITP programme and the principals have agreed in principle for the contribution. Thus, we will be able to collect Rs.25 lakhs from these colleges and hand it over to you to undertake DRS - ITP programme. We request you kindly to take up networking of all the colleges at the earliest.

Thanking you,

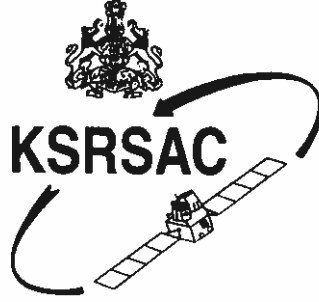
Yours faithfully,

(Dr. Viresh K. Basalalli)
REGISTRAR

Copy to : The Secretary to Vice Chancellor, for information.

OC

Dr. H. Honne Gowda
Director



**Karnataka State Remote
Sensing Applications Center**
Department of Information Technology
Government of Karnataka

No: KRSRAC/VTU-DRS-ITP/2001

August 9, 2001

Dear Sir,

Thank for your letter dated August 8, 2001 regarding release of grants for initiating DRS-ITP programme for Engineering colleges in Karnataka. Based on your letter KRSRAC is taking steps to establish DRS terminals at fifteen Engineering colleges in Karnataka through Development and Educational Communication Unit, Space Applications Center, ISRO, Ahmedabad. In this context, DECU has requested immediately the details such as complete address, focal point/co-ordinator name, contact number etc for the proposed fifteen locations to enable them to initiate appropriate action for procurement of fifteen numbers of DRS terminals. In view of this, I would greatly appreciate, if you could kindly send those details at the earliest.

The identification of locations for installations of DRS could be decided based on the following criteria:

- Non-availability/shortage of faculty for teaching courses such as IT, Computer and allied subjects
- The colleges which requires boosting of supplementary teaching to improve the quality of education
- The colleges which are situated at remote places

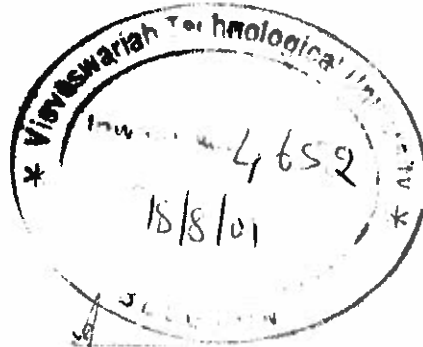
With best regards

Yours sincerely,

(H Honne Gowda)

Dr Viresh K Basalalli
Registrar,
VTU, Belgaum

CC: Dr Balaveera Reddy
Vice Chancellor
VTU, Belgaum





4

**Memorandum of Understanding
Between
The Visveshvaraya Technological University (VTU)
And
Karnataka State Bio fuel Development Board.
Government of Karnataka**

FOR THE ESTABLISHMENT OF INFORMATION CENTRE/DEMONSTRATION CENTRE

1. This Memorandum of Understanding (MOU) drawn on Wednesday, 7th March 2012,

between

**Karnataka State Bio fuel Development Board.
Government of Karnataka
No. 116, 8th cross, Kumara park west,
Railway parallel Road, Bangalore 5600 020**

and

**Visvesvaraya Technological University
"Jnana Sangama", Belgaum-590 018**

Hereinafter refer to as the partners of the project with their Abbreviated names as KSBFDB and VTU

2. The purpose of this MOU is to set up information Centre/ Demonstration Centre to provide information for all the public, farmers, bio fuel cultivators, researchers and entrepreneurs in the fields of bio fuels. The field of bio fuels covers providing information on different plant species, harvesting, marketing, processing, value addition and all related information on bio fuels. This information centre eventually covering all activities of bio-diesel and bio-ethanol sector shall serve as a role model for all others.
3. The partners have mutually agreed to come together to plan, implement and establish Information Centre with objectives, roles and deliverables reflected in detail here under:

A. This Information Centre has been conceptualized as a showcase to study, promote and demonstrate all aspects of the bio-fuel business namely,

1. Providing information on Bio Fuels.
2. Various sources of oil.
3. Agronomic practices for these sources.
4. Post-harvest technologies like de-cortication, oil expelling etc.
5. Treatment & uses of oils.
6. Trans-esterification methods & efficiencies.
7. Quality control of seeds, oils & blended bio-diesel & ethanol.
8. Optimization of usage of straight vegetable oils SVO's & blended bio-fuels.
9. Exploration of various business models w.r.t. Bio-fuel sector.
10. R&D and extension services.

B. The Information Centre shall serve to meet the needs of all stake holders of the Bio-Fuel sector which will mean and include:

1. Rural masses
2. Framing community
3. NGO's, women's, Self Help Groups
4. Entrepreneurs
5. Banks
6. Agricultural research organizations
7. Members of various trades like seed & oil collectors, oil expellers
8. Bio-diesel processing units & dealers
9. Equipment manufacturers & dealers
10. Power & Transport Industry
11. State & Central Governments & Local bodies
12. Consumers etc.

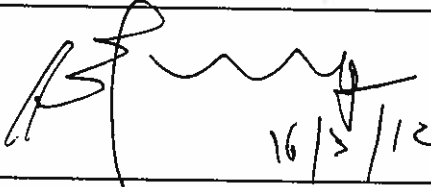
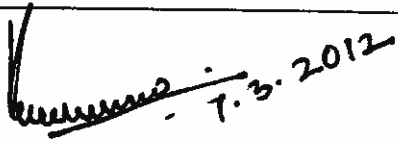
C. The Information Centre shall endeavor to contribute to the socio-economic status of the nation by

1. Serving the rural masses
2. Helping to meet the energy needs of the region
3. Helping in prevention of desertification by putting waste - lands to productive use
4. Alleviate poverty through additional rural income
5. Help in the sustainable over all development through renewable fuel like Bio-diesel.
6. To bring in industry support and support of the research community.


4. The university will provide the necessary place free of cost for the establishment of Information Centre along with support of manpower for its administration and maintenance apart from mandatory requirements for the establishment of plant and machinery such as water, power etc. in the Information/ Demonstration Centre.
5. The University may use Information/Demonstration Centre for the research & development activities for its students & faculty.
6. The University shall process the seeds and market its products such as seeds, oil, cake, bio-diesel and it's by products at its discretion. However an effort may be made to consume the products locally.
7. The University may invite outside partners for specific techno-commercial activities like buy-back arrangements, marketing operation of expellers/generator sets, processing units etc., if necessary.
8. The University may also collaborate with various organizations involved in similar activities to increase the knowledge-base or share domain expertise.
9. The University shall typically develop nurseries, seed propagation, demoplantation of all oil-seeds bearing plants, expelling units, Bio Diesel processing plant, Biogas plant from agro-wastes/Oil cake, Bio DG Power generation, Tillers, Tractors, vehicles running on bio-diesels.
10. The University shall establish testing facilities for seeds testing, oil testing and research facilities focused on agronomic, engineering and manufacturing aspects of Bio-Diesel.
11. The KSBDB shall provide 100% funding for information material, literature & for the establishment of information/demonstration Centre in the University.
12. The VTU shall provide funding for specific and time bound R & D activities in the field of bio-fuels carried out by the Information/Demonstration Center.

13. The VTU shall co-ordinate in bringing the funds from Govt. of India such as Dept. of Science & Technology, Ministry of Petroleum & Natural Gas, Ministry of New & Renewable Energy, Dept. of Bio-Technology etc. for the Research & Development activities to be carried out by the information/ demonstration Centre.
14. In case of any dispute regarding non fulfillment of the objectives of this information centre or any other dispute relating to the implementation of the terms and conditions of this MOU, the same shall be referred to the sole arbitrator appointed after mutual discussion and the said arbitrator shall carry on the arbitration work at Belgaum as per the provisions of the Arbitration & Conciliation Act 1996. All disputes shall be subject to Belgaum jurisdiction.

The partners of this MOU namely Karnataka State Bio-fuel Development Board and Visvesvaraya Technological University hereby attest their commitment to this project by affixing their signatures in agreement to the above clauses and accept to extend whole-hearted co-operation to establish this information Centre.

<p>Managing Director Karnataka State Bio-fuel Development Board, Government of Karnataka Bangalore</p>	<p>The Registrar Visvesvaraya Technological University "JnanaSangama" Belgaum</p>
 <p>16/3/12</p>	 <p>- 7.3.2012</p>

**Managing Director
Karnataka State Biofuel Development Board
Bangalore**


(G.N. Daganands)
Manager - Marketing .

AGREEMENT
Between
VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM
&
EdCIL(India) Limited, New Delhi

This agreement herein after referred to as "Agreement" is made on 28th day of April 2012.

BETWEEN

EdCIL (India) Limited , a company registered under the Companies Act 1956 and a Public Sector Undertaking affiliated to the Ministry of Human Resource Development, Government of India and having its registered office at 10-B, Indraprastha Marg, New Delhi - 110 002 and corporate office situated at EdCIL House, 18-A, Sector 16-A, NOIDA - 201 301 [U.P.], hereinafter to be referred to as "EdCIL" of the first part which expression shall include its legal successors and permitted assigns.

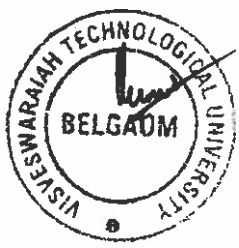
AND

Visvesvaraya Technological University, Belgaum hereinafter to be referred to as "VTU Belgaum" of the second part which expression shall include its legal successors and permitted assigns.

WHEREAS, EdCIL is a nodal agency for arranging admission and placement of International Students [foreign Nationals, Persons of Indian Origins and Non-Resident Indians] to pursue study and training in Indian educational institutions.

AND WHEREAS, VTU, Belgaum offers various courses in Engineering, Technology, Management in Post Graduate and Doctoral Programs.

Now, both the parties agree to the implementation of the placement program(s) on the terms and conditions appearing hereinafter:



SECTION A

OBLIGATIONS OF EDCIL (INDIA) LIMITED

1. On receipt of requests for admission from sponsoring agencies / Self-Financing Students(s), EdCIL after initial scrutiny, will forward the application of eligible candidates to VTU, Belgaum for determination of eligibility and grant of provisional admission.
2. Upon receipt of provisional admission for a student from VTU, Belgaum, EdCIL shall arrange clearances, if required, from the Ministries of External and Home Affairs, Government of India for entry and stay of the student in India.
3. EdCIL shall receive the Institutional Economic Cost (IEC) and Student Cost (SC) from sponsoring agency / Self-Financing Student(s). Upon receipt of the same, EdCIL shall remit the Institutional Share to VTU, Belgaum against invoice raised by VTU, Belgaum by deducting its service charges. This disbursement of Institutional Share to VTU, Belgaum shall be done on a yearly/semester basis, at the commencement of the academic year/semester in Indian Rupees at the exchange rate at which the remittance has been received. The SC will be directly paid to the students.
4. Institutional Share will be remitted by EdCIL upon receiving documentary evidence from VTU, Belgaum of eligibility, provisional admission certificate and State Government clearances, if required. EdCIL shall receive semester-wise / annual progress report of each student admitted to VTU, Belgaum for onward transmission to the sponsoring agency / parents of Self-Financing Student(s).
5. EdCIL, after consultation with VTU, Belgaum shall inform the sponsoring agency / parents of Self-Financing Student(s) of any bridge courses, which may be required, on a case to case basis. On concurrence of the sponsoring agency / parents of Self-Financing Student(s), EdCIL will remit the cost of the same to VTU, Belgaum which shall be over and above the IEC.



6. EdCIL shall keep foreign funding agencies informed about the educational facilities available at VTU, Belgaum from time to time.

SECTION B

OBLIGATIONS OF VTU, BELGAUM

1. VTU, Belgaum shall conduct the courses in accordance with the approved syllabi of University. The details of courses to be offered by VTU, Belgaum and eligibility requirement for admission thereto shall be made available to EdCIL by March 31 of each year.
2. VTU, Belgaum shall take clearance from the State Government, if required. This will include academic eligibility and provisional admission. Upon receipt of the placement request from EdCIL, VTU, Belgaum will, along with documentary evidence, intimate the same expeditiously to EdCIL.
3. VTU, Belgaum shall provide reasonably good hostel accommodation to the student(s) with facilities agreed upon in writing.
4. VTU, Belgaum shall raise invoice (s) on EdCIL, towards Institutional Economic Cost as per the agreed amount, in respect of student (s) admitted, giving detailed particulars of the student (s), course to which admitted, year of invoice and the progress report for the previous academic year.
5. VTU, Belgaum shall send to EdCIL six monthly/ annual progress report of each student placed by EdCIL, along with the invoice for IEC. However, adverse performance like prolonged absenteeism, indiscipline, etc shall be reported to EdCIL immediately.



6. VTU, Belgaum shall provide a provisional Certificate to each student at the end of the course and arrange to send the Degree directly to the student concerned within one year after the completion of course requirements. VTU, Belgaum will also forward a copy of all the certificates to EdCIL.
7. VTU, Belgaum shall send every year, a statement of accounts of Institutional Economic Cost of all individual students admitted through EdCIL at VTU, Belgaum and shall also submit supporting documents relating to disbursement/expenditure, wherever required.
8. VTU, Belgaum shall promptly inform EdCIL regarding the joining and leaving of each foreign student.
9. VTU, Belgaum shall provide medical facilities for routine ailments to the foreign students, the cost of which shall be included in the Institutional Economic Cost. Any medical assistance or treatment of a specialized nature for such student(s) sponsored by a Foreign Government / Funding Agency shall be arranged for by VTU, Belgaum the cost of which shall be reimbursed to VTU, Belgaum by the sponsoring/funding agency through EdCIL on submissions of claim with bills.
10. All the Foreign students will have to abide by the regulations and discipline of the VTU, Belgaum and any major disciplinary action that arises resulting in the expulsion of the student will be done in consultation with EdCIL.
11. VTU, Belgaum shall take appropriate steps for ensuring that there is no ragging of foreign students in the College/Hostel and strict disciplinary action will be taken against any such happening.
12. VTU, Belgaum shall nominate a Foreign Students Advisor for foreign students who shall provide all necessary information to students.
13. VTU, Belgaum shall indicate the Institutional Economic Cost (IEC) to EdCIL in US Dollars. Such IEC shall be applicable for all the foreign students who are admitted under this MOU during their entire course of study. The IEC



from the academic year 2008-2009 onwards, until revised, shall be as given hereunder:

Course	Institute's Share (US\$)	EdCIL's Service Charges (US\$)		Institutional Economic Cost per Student Per Annum (Institute's share + EdCIL Service Charges) (US\$)	
		10% of Institute's Share for the First Year	5% of Institute's Share for the Subsequent Years	First Year	Subsequent Years
As per Annexure - 'A'					

[Please note that if the hostel is not within the campus, the college has to arrange for the transport of the students from hostel to college and back. If the students are asked to arrange for their own transport, the cost incurred by them shall be reimbursed by the College / Institute].

The Institutional Share includes the following expenses:

- Tuition Fee,
- All initial university charges like eligibility fee, admission fee, regular examination fee etc.,
- Campus facilities,
- Local Industrial visits,
- Hostel accommodation (room rent) and Mess establishment [exclusive of mess fee],
- Water/electricity charges,
- Medical facility through the institute's dispensary.

14. Any changes in the Institutional Economic Cost that may be agreed upon by EdCIL and VTU, Belgaum shall be incorporated as an amendment to this Agreement. However, such changes would not affect the student (s) already admitted under the costs stipulated earlier.



15. VTU, Belgaum shall ensure that the number of intake of foreign students in various courses is as per the norms set by the Government of ~~Andhra Pradesh~~ KARNATAKA.
16. VTU, Belgaum shall not directly deal with foreign students admitted through EdCIL in matters relating to Institutional Economic Cost and other matters that come within the purview of EdCIL as per this Agreement.
17. VTU, Belgaum shall ensure that the IEC charged from foreign students admitted by VTU, Belgaum directly is not less than the Institutional Share being charged in the case of EdCIL placed foreign students.
18. VTU, Belgaum shall not directly admit the students sponsored by the Clients previously introduced by EdCIL. In case, the Client approaches the institution directly, such applications should be referred to EdCIL.
19. In case the students leave the college in the middle of the academic year, the Institutional Economic Cost to be charged by the College shall be proportionate to their period of stay in the College.

FORCE MAJEURE

If due to "Force Majeure" like riots, political disturbances, floods, war-like operations or any other similar reason, it becomes advisable or necessary in the agreed opinion of EdCIL and VTU, Belgaum to terminate work under this Agreement, the Agreement may be terminated at any time by mutual consent in writing. In case the parties do not agree, the Agreement may, under the said circumstances, be terminated by one party by giving 30 days notice in writing to the other party. Such termination will be effective in the matter specified in the said notice and will be without prejudice to the claims which any of the parties may have against the other on the termination of this Agreement in the manner aforesaid.



DURATION AND TERMINATION OF THE AGREEMENT

This Agreement will be valid for a period of 5 years and would be effective from the date of signing of this agreement.

During the period the Agreement is under operation, it can be terminated with the written consent of both the parties or by giving two weeks notice in writing to the other party, who shall have no claim to any damages, or compensation or profit or advantage they might have derived from execution of this Agreement in full. However, students undergoing study as per this Agreement will complete their program and study as per the provision of this Agreement.

AMENDMENT TO THE AGREEMENT

Should the circumstances arise which call for amendment to this Agreement, these may be made by mutual consent of both the parties in writing. Proposals in this regard from one party shall be given due consideration by the other party.

LIABILITY

Neither party shall be liable for indirect or consequential damages.

ARBITRATION

Any dispute arising with regard to any aspect of this Agreement or in connection therewith between the two concerned parties to the Agreement shall be resolved as far as possible by mutual discussion & consultations. In case the dispute remains unresolved through consultation, it shall be referred to an Arbitrator, to be appointed in consultation by the two parties involved in the dispute subject to the jurisdiction being Delhi. The award of the Arbitrator shall be binding on both the parties.



[Handwritten signature]

FOR AND ON BEHALF OF
EDCIL (INDIA) LIMITED, NEW DELHI

Dr. SHAIK SULEMAN
Dy. General Manager &
Head (Placement & Secondment)
EdCIL (India) Limited

WITNESS:

(A Government of India Enterprises)
EdCIL House, Plot No. 18-A, Sector-18-A
P.O. Indira Park, New Delhi-110028, India

1. PAMME KOHLI
DMCP

2. *Samir*
SAMIR NARULA

[Handwritten signature]
28.4.2012

FOR AND ON BEHALF OF
VISVESVARAYA TECHNOLOGICAL
UNIVERSITY, BELGAUM

Registrar
Visvesvaraya Technological
University, BELGAUM-590 015

WITNESS:

1. *[Handwritten signature]*
(Cen Bellary)
PRO VTU

2. *[Handwritten signature]*
(Namitha Kulkarni)
private secretary, VTU



COURSE	Institute's Share	EdCIL's Service Charges (US\$)		Institutional Economic Cost (Institute's share+ EdCIL Service Charges) per Student Per Annum (US\$)	
		10% of Institute's Share for the First Year	5% of Institute's Share for the Subsequent Years	First Year	Subsequent Years
		(US\$)	(US\$)	(US\$)	(US\$)
Constituent College UBDTCE, Davangere Bachelor of Engineering in - Computer Science - Electronics & Instrumentation Tech. - Industrial & Production - Civil - Mechanical - Electrical & Electronics - Electronics & Communication	4400	440	220	4840	4620
Constituent College UBDTCE, Davangere Master of Technology in - Computer Aided Design of Structures - Environmental Engineering - Machine Design - Thermal Power Engineering - Power System Engineering - Digital Communication & Networking - Computer Science & Engineering - Production Engineering & System Technology	3300	330	165	3630	3465



Master of Technology at PG Centre's of VTU <u>Belgaum PG Centre</u> - Computer Network Engg (CS) - VLSI Design and Embedded Systems ((EC) - Product Design & Manufacturing (Mech) - Computer Science & Engg (CS) - Water Resource Management (CV) - Water & Land Management (CV) <u>Gulbarga PG Centre</u> - Computer Science & Engg. (CS) - Thermal Power Engineering (Mech) <u>Mysore PG Centre</u> - Industrial Automation Engg. <u>Bangalore PG Centre</u> - Infrastructure Management (MBA) - Nano-Bio-Technology (Mech) - Aerospace Propulsion Tech. (Mech) - Computer Aided Engg (CS) - Computer Science & Engg (CS) - Digital Electronics & Communication Systems (EC)	3300	330	165	3630	3465
Master of Business Administration (Bangalore, Gulbarga, Mysore, Belgaum PG Centre's & UBDTCE, Davangere)	3300	330	165	3630	3465
Master of Computer Application (Bangalore, Gulbarga, Mysore, Belgaum PG Centre's & UBDTCE, Davangere)	4200	420	210	4620	4410
M.Sc. (Engg.) by Research in the faculty of Engineering	4500	450	225	4950	4725

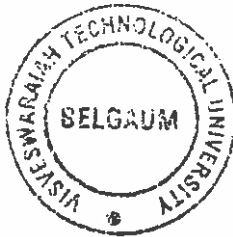


Doctor of Philosophy (Ph.D.) in - Faculty of Engineering - Faculty of Science - Faculty of Architecture - Faculty of Computer Application - Faculty of Business Administration	4400	440	220	4840	4620
---	------	-----	-----	------	------

Note: The above fees do not include the hostel accommodation, mess fees and other university development charges .

[Handwritten Signature]
 28.11.2012
 Authorized Signatory with Rubber Stamp

**Registrar
 Visvesvaraya Technological University
 BELGAUM-590 018.**



BELOW - 200 018
UNIVERSITY OF TECHNOLOGY
LONDON



6

Visvesvaraya Technological University (VTU), Belgaum
and
Karnataka State pollution Control Board (KSPCB),
Bangalore

DETAILS FOR CREATION (Establishment and Institution) OF
PROFESSORIAL CHAIR

1. INTRODUCTION:

Visvesvaraya Technological University, (VTU), Belgaum, is a premier technical university engaged in imparting quality education in Engineering, Science & Technology as well as in Research and Development in contemporary fields by affiliating more than 200 technical institutions in the State of Karnataka. With competent and well experienced faculty members of all disciplines in engineering and technology, Visvesvaraya Technological University, over the year has carved out a niche for itself amongst the best technical universities in India. The primary objective of the University is to produce competent engineers with an innovative bent of mind, offer high quality education, consultancy and testing services and generate new knowledge, through research and development, for the benefit of industry and society.

University now offers Engineering Undergraduate Programmes (4 year BE/B.Tech) and postgraduate programmes (2 years ME/M.Tech) including MBA and MCA and M.sc (Engg) and also Doctoral programmes in major and emerging areas of Engineering, Science and Technology. Many R&D Programmes offered are need based and industry oriented projects.

The talent pool of the University comprises of more than 200 Institutions with nearly 20,000 faculty members and equal number of Technical supporting staff, the Visvesvaraya Technological University, is growing rapidly in recent years, in terms of academic programmes and Research activities. The University lays great importance on R&D activities, interaction with industries, consultancy and out-reach activities etc. In order to strengthen these activities further and to encourage research in thrust areas and interdisciplinary topics, Visvesvaraya Technological University, plans to institute Professorial Chair in association with Karnataka State Pollution Control Board, Bangalore which is a statutory body to prevent, control and monitor the Environmental Pollution in the state of Karnataka. The Chair created by these two agencies will be effectively used to take up Specific projects related to Environmental Pollution Prevention and Control and Management.



2. ROLE OF PROFESSORIAL CHAIR:

The primary responsibilities of the Professorial Chair would be to coordinate projects concerning environmental issues in industries and elsewhere through KSPCB and VTU. This includes the following contractual obligations

- To support Karnataka State Pollution Control Board, in evolving policy/standards for Environmental governance
- To promote Interdisciplinary /Multi-disciplinary R&D work of interest to the Industry/Society and Karnataka State Pollution Control Board.
- To identify and create a data base of experts in engineering colleges affiliated to VTU having expertise in different areas of environmental issues and entrust them with projects of concern to industries.
- To identify centres of excellence in environmental related areas in engineering colleges affiliated to VTU and to entrust them with problems of concern to KSPCB
- To support sponsoring agencies for organizing conferences/seminars, symposia / workshops etc.
- To take up pollution related problems, solving with the group of experts identified by the chair.
- To take up regional carrying? capacity studies including Monitoring and evaluation studies for cluster of industries.
- To establish state of art laboratory to cater to the needs of industries.
- To capacity building of Academic Institutions/Organizations covered by KSPCB on environmental related issues.

With the above objectives the Professorial Chair created is expected to contribute significantly to raise the level of R&D activities and Interaction with different stakeholders and also to bring in greater degree of professionalism in developing awareness to reduce the pollution due to developmental activities.

A Professorial Chair can be created at its Head Quarters or in any one of the regional centers of the university or in its constituent college viz., UBDT college of Engineering, Davangere.

The Karnataka State Pollution Control Board may identify such of the problems required which can be entrusted the chair like pollution monitoring, environmental status report preparation, water and air quality monitoring etc.

3. FINANCIAL ASPECTS FOR PROFESSORIAL CHAIR:

To start the professorial chair, Visvesvaraya Technological University, and Karnataka State Pollution Control Board, shall contribute Rs.1.0 crore (Rupees one crore only) each as corpus to establish the same and Interest earned out of the deposit may be used for meeting the salary, contingency expenses for the professorial chair. Any agency / industry may contribute additionally to the expenses of extra staff and consumables required for assigned projects from



A handwritten signature in black ink, appearing to be a stylized name.

stake holders. As per the present Government of India rules all contributions to the Universities by sponsorers are eligible for 100% tax exemption under section 80G of Indian Income tax rules.

4. GUIDELINES FOR MOU

The MoU to be signed between Visvesvaraya Technological University and Karnataka State Pollution Control Board should specify the following:

- The Model for the Professorial Chair
- The Department/Centre to which the Professor would be attached
- The desired broad fields of activity or expertise for the Professorship.
- The Search Committee to identify the person for the Parisara Chair.

The proposal for instituting a Chair Professorship may be initiated by the Visvesvaraya Technological University or Karnataka State Pollution Control Board. If the proposal is acceptable, steps would be taken to get it approved and sign an MoU with the sponsoring organization. The MoU will specify the members of the Search Committee which would include:

- (1) Chairman KSPCB as chairman of selection committee
 - (i) Registrar of the University
 - (ii) Member secretary of KSPCB
 - (iii) Special Officer (R&D)
 - (iv) One eminent person from the industry (nominated by KSPCB)
 - (v) One eminent person from Academic/R&D institution (Nominated by VTU) as members of Selection committee.

The selection committee shall select a suitable person/candidate and recommend for appointment by the Vice Chancellor, Visvesvaraya Technological University to the Professorial Chair.

Designation: The person appointed against the Chair Professorship will be called "VTU Parisara Chair Professor"

Eligibility: Any person with a proven track record as an outstanding teacher (in the rank of Professor or researcher) with PhD/Master Degree in Environment field and significant R&D practical experience be eligible for appointment to the Visvesvaraya Technological University, parisara Chair Professorship. He/she shall be a reputed researcher/ scholar/ scientist / professional in the field of Environmental Pollution and Control and shall have relevant practical experience with a strong publication in Environmental Pollution monitoring and control.

Salary & Benefits: The salary/honorarium of the Visvesvaraya Technological University, Parisara Chair Professor would be met out of the interest earned from the corpus fund created by Visvesvaraya Technological University and Karnataka State Pollution Control Board.



A handwritten signature in black ink, consisting of several loops and a long horizontal stroke.

Visvesvaraya Technological University, also provides.

- Furnished Office Room with internet connection along with office assistant and technical assistant.
- Residential accommodation as provided to other Professors of the University.
- Access to Library, Computer Centre, Laboratories, Workshops, etc.
- Medical benefits as provided to any Professor of University
- Dedicated Vehicle be provided to the chair for official travel and other institutional use.

IPR: All patent rights of design, inventions, research results etc. derived out of the projects, if any, during the period of appointment of Parisara Chair Professor at Visvesvaraya Technological University, shall belong to both Visvesvaraya Technological University, and the Karnataka State Pollution Control Board jointly. (Shall be a joint claim of both KSPCB and VTU)



A handwritten signature or mark, possibly a stylized 'V' or 'VTU', located to the right of the stamp.



MEMORANDUM OF UNDERSTANDING

between

Visvesvaraya Technological University (VTU)
Belgaum
and
Karnataka State Pollution Control Board,
(KSPCB) Bangalore

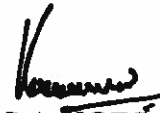
Visvesvaraya Technological University (VTU) Belgaum represented by its Registrar and Karnataka State Pollution Control Board, (KSPCB) Bangalore represented by its Member Secretary signed the memorandum of understanding on this day of 29th day of August 2012 at Bangalore on the following terms to institute a professorial chair at Visvesvaraya Technological University (VTU), Belgaum at any one of Regional Offices of VTU / Constituent college of VTU.


- (1) VTU & KSPCB contributes Rs.1.0 crore (Rupees one crore only) each and this contribution of Rs.2.0 crores (Rupees two crores only) be kept as fixed deposit in any one of the Nationalized Bank in the name of Parisara Chair at VTU. The interest earned out of the deposit may be used for the activities of the chair and its establishment charges.
- (2) KSPCB may identify the environment related problems and entrust the same to the Chair for investigations or for remedial solutions.
- (3) The Professorial Chair may identify the persons in the relevant field and coordinate with the KSPCB to complete the study entrusted to the chair.
- (4) Roles and functions/responsibilities of the chair shall be as indicated in Annexure.
- (5) The selection committee shall select a suitable person/candidate and recommend for appointment by the Vice Chancellor, Visvesvaraya Technological University to the Professorial Chair.
- (6) The interest earned out of the fixed deposit be made use for the salary of the chair, one Assistant and contingency expenses for the activities of the chair.
- (7) The Chair will function from any one of the Regional Offices of VTU/constituent college of VTU.
- (8) The corpus created for setting up of the professorial chair shall not be utilized for any other purpose. However, the proceeds accrued out of corpus shall be utilized for the activities of the professorial chair as detailed above.



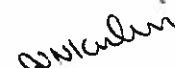
- (9) The proceeds from the corpus and all project related receipts shall be deposited in a separate account in the name of the chair and shall be operated by the professorial chair only and necessary books of accounts shall be maintained.
- (10) The annual accounts of the chair shall be audited by VTU by following the VTU norms and Audited report copy of the same shall be made available to the KSPCB.
- (11) The activities of the Chair shall be reviewed every six months jointly by KSPCB & VTU.
- (12) VTU shall provide the following facilities which are essential for the chair to conduct its activities.
- Furnished Office with internet connection along with office assistant and technical assistant.
 - Residential accommodation and Medical benefits as provided to other Professors of the University.
 - Access to Library, Computer Centre, Laboratories, Workshops, etc.
 - Dedicated Vehicle be provided to the chair for official travel and other institutional use.
- (13) **IPR:** All patent rights design and inventions derived, research results etc. during the period of stay at Visvesvaraya Technological University, Parisara Chair Professor at Visvesvaraya Technological University, shall belong to both Visvesvaraya Technological University, and the Karnataka State Pollution Control Board jointly.

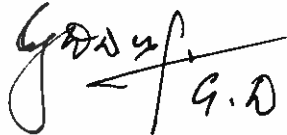
Accepted the above terms on behalf of Visvesvaraya Technological University, and Karnataka State Pollution Control Board.


29.8.2012
DR.S.A.KORI
Registrar
VTU, Belgaum
REGISTRAR
Visvesvaraya Technological University
BELGAUM


S.M.PUNTABUDDHI, IFS
Member Secretary
KSPCB, Bangalore

Witnesses

(1) 
Private Secretary.

(2) 
G.D. Dixit
AO





Memorandum of Understanding

between

Visvesvaraya Technological University (VTU), Belgaum

&

Karnataka State Pollution Control Board (KSPCB), Bangalore

Visvesvaraya Technological University (VTU) Belgaum represented by its Registrar and Karnataka State Pollution Control Board, (KSPCB) Bangalore represented by its Member Secretary signed the memorandum of understanding on this day of 29th August, 2012 at Bangalore on the following terms to institute a professorial chair at Visvesvaraya Technological University (VTU), Belgaum at any one of Regional Offices of VTU / Constituent college of VTU.

- (1) VTU & KSPCB contributes Rs. 1.0 crore (Rupees one crore only) each and this contribution of Rs.2.0 crores (Rupees two crores only) be kept as fixed deposit in any one of the Nationalized Bank in the name of 'Parisara Chair' at VTU. The interest earned out of the deposit may be used for the activities of the chair and its establishment charges.
- (2) KSPCB may identify the environment related problems and entrust the same to the Chair for investigations or for remedial solutions.
- (3) The Professorial Chair may identify the persons in the relevant field and co-ordinate with the KSPCB to complete the study entrusted to the chair.
- (4) Roles and functions/responsibilities of the chair shall be as indicated in Annexure.
- (5) The Search Committee shall select a suitable person/candidate and recommend for appointment by the Vice Chancellor, Visvesvaraya Technological University to the Professorial Chair.
- (6) The interest earned out of the fixed deposit be made use for the salary of the chair, one Assistant and contingency expenses for the activities of the chair.
- (7) The Chair will function from any one of the Regional Offices of VTU/constituent college of VTU.
- (8) The corpus created for setting up of the professorial chair shall not be utilized for any other purpose. However, the proceeds accrued out of corpus shall be utilized for the activities of the professorial chair as detailed above.

- (9) The proceeds from the corpus and all project related receipts shall be deposited in a separate account in the name of the chair and shall be operated by the professorial chair only and necessary books of accounts shall be maintained.
- (10) The annual accounts of the chair shall be audited by VTU by following the VTU norms and Audited report copy of the same shall be made available to the KSPCB.
- (11) The activities of the Chair shall be reviewed every six months jointly by KSPCB & VTU.
- (12) VTU shall provide the following facilities which are essential for the chair to conduct its activities.
- Furnished Office with internet connection along with office assistant and technical assistant.
 - Residential accommodation and Medical benefits as provided to other Professors of the University.
 - Access to Library, Computer Centre, Laboratories, Workshops, etc.
 - Dedicated Vehicle be provided to the chair for official travel and other institutional use.
- (13) IPR: All patent rights design and inventions derived, research results etc. during the period of stay at Visvesvaraya Technological University, 'Parisara Chair' Professor at Visvesvaraya Technological University, shall belong to both Visvesvaraya Technological University, and the Karnataka State Pollution Control Board jointly.

Accepted the above terms on behalf of Visvesvaraya Technological University, and Karnataka State Pollution Control Board.

Dr.S.A.KORI Registrar VTU, Belgaum	S.M.PUTTABUDDHI, IFS Member Secretary KSPCB, Bangalore

Witnesses

(1)

(2)

Annexure

Visvesvaraya Technological University (VTU), Belgaum - 590 018
and
Karnataka State Pollution Control Board (KSPCB), Bangalore - 560 001.
Establishment and Institution of "PARISARA CHAIR"
(PROFESSORIAL CHAIR)

1. INTRODUCTION:

Visvesvaraya Technological University, (VTU), Belgaum, is a premier technical university engaged in imparting quality education in Engineering, Science & Technology as well as in Research and Development in contemporary fields by affiliating more than 200 technical institutions in the State of Karnataka. With competent and well experienced faculty members of all disciplines in engineering and technology, Visvesvaraya Technological University, over the year has carved out a niche for itself amongst the best technical universities in India. The primary objective of the University is to produce competent engineers with an innovative bent of mind, offer high quality education, consultancy and testing services and generate new knowledge, through research and development, for the benefit of industry and society.

University now offers Engineering Undergraduate Programmes (4 year BE/B.Tech) and postgraduate programmes (2 years ME/M.Tech) including MBA and MCA and M.Sc (Engg) and also Doctoral programmes in major and emerging areas of Engineering, Science and Technology. Many R&D Programmes offered are need based and industry oriented projects.

The talent pool of the University comprises of more than 200 Institutions with nearly 20,000 faculty members and equal number of Technical supporting staff, the Visvesvaraya Technological University, is growing rapidly in recent years, in terms of academic programmes and Research activities. The University lays great importance on R&D activities, interaction with industries, consultancy and out-reach activities etc. In order to strengthen these activities further and to encourage research in thrust areas and interdisciplinary topics, Visvesvaraya Technological University, plans to institute Professorial Chair in association with Karnataka State Pollution Control Board, Bangalore which is a statutory body to prevent, control and monitor the Environmental Pollution in the state of Karnataka. The Chair created by these two agencies will be effectively used to take up Specific projects related to Environmental Pollution Prevention and Control and Management.

2. ROLE OF PROFESSORIAL CHAIR:

The primary responsibilities of the Professorial Chair would be to coordinate projects concerning environmental issues in industries and elsewhere through KSPCB and VTU. This includes the following contractual obligations

- To support Karnataka State Pollution Control Board, in evolving policy/standards for Environmental governance
- To promote Interdisciplinary /Multi-disciplinary R&D work of interest to the Industry/Society and Karnataka State Pollution Control Board.
- To identify and create a data base of experts in engineering colleges affiliated to VTU having expertise in different areas of environmental issues and entrust them with projects of concern to industries.
- To identify centres of excellence in environmental related areas in engineering colleges affiliated to VTU and to entrust them with problems of concern to KSPCB
- To support sponsoring agencies for organizing conferences/seminars, symposia / workshops etc.
- To take up pollution related problems, solving with the group of experts identified by the chair.
- To take up regional carrying capacity studies including monitoring and evaluation studies for cluster of industries.
- To establish state of art laboratory to cater to the needs of industries.
- To capacity building of Academic Institutions/Organizations covered by KSPCB on environmental related issues.

With the above objectives the Professorial Chair created is expected to contribute significantly to raise the level of R&D activities and Interaction with different stakeholders and also to bring in greater degree of professionalism in developing awareness to reduce the pollution due to developmental activities.

A Professorial Chair can be created at its Head Quarters or in any one of the regional centers of the university or in its constituent college viz., UBDT college of Engineering, Davangere.

The Karnataka State Pollution Control Board may identify such of the problems required which can be entrusted the chair like pollution monitoring, environmental status report preparation, water and air quality monitoring etc.

3. FINANCIAL ASPECTS FOR PROFESSORIAL CHAIR:

To start the professorial chair, Visvesvaraya Technological University, and Karnataka State Pollution Control Board, shall contribute Rs.1.0 crore (Rupees one crore only) each as corpus to establish the same and Interest earned out of the deposit may be used for meeting the salary, contingency expenses for the professorial chair. Any agency / industry may contribute additionally to the expenses of extra staff and consumables required for assigned projects from stake holders. As per the present Government of India rules all contributions to the Universities by sponsors are eligible for 100% tax exemption under section 80G of Indian Income tax rules.

4. GUIDELINES FOR MOU

The MoU to be signed between Visvesvaraya Technological University and Karnataka State Pollution Control Board should specify the following:

- The Model for the Professorial Chair
- The Department/Centre to which the Professor would be attached
- The desired broad fields of activity or expertise for the Professorship.
- The Search Committee to identify the person for the Parisara Chair.

The proposal for instituting a Chair Professorship may be initiated by the Visvesvaraya Technological University or Karnataka State Pollution Control Board. If the proposal is acceptable, steps would be taken to get it approved and sign an MoU with the sponsoring organization. The MoU will specify the members of the Search Committee which would include:

- (1) Chairman KSPCB as chairman of selection committee
 - (i) Registrar of the University
 - (ii) Member Secretary of KSPCB
 - (iii) Special Officer (R&D)
 - (iv) One eminent person from the industry (nominated by KSPCB)
 - (v) One eminent person from Academic/R&D institution (Nominated by VTU) as members of Selection committee.

The Search Committee shall select a suitable person/candidate and recommend for appointment by the Vice Chancellor, Visvesvaraya Technological University to the Professorial Chair.

Designation: The person appointed against the Chair Professorship will be called "VTU Parisara Chair Professor"

Eligibility: Any person with a proven track record as an outstanding teacher (in the rank of Professor or researcher) with PhD/Master Degree in Environment field and significant R&D practical experience be eligible for appointment to the Visvesvaraya Technological University, Parisara Chair Professorship. He/she shall be a reputed researcher/ scholar/ scientist / professional in the field of Environmental Pollution and Control and shall have relevant practical experience with a strong publication in Environmental Pollution monitoring and control.

Salary & Benefits: The salary/honorarium of the Visvesvaraya Technological University, Parisara Chair Professor would be met out of the interest earned from the corpus fund created by Visvesvaraya Technological University and Karnataka State Pollution Control Board.

Visvesvaraya Technological University, also provides:

- Furnished Office Room with internet connection along with office assistant and technical assistant.
- Residential accommodation as provided to other Professors of the University.
- Access to Library, Computer Centre, Laboratories, Workshops, etc.
- Medical benefits as provided to any Professor of University
- Dedicated Vehicle be provided to the chair for official travel and other institutional use.

IPR: All patent rights of design, inventions, research results etc. derived out of the projects, if any, during the period of appointment of Parisara Chair Professor at Visvesvaraya Technological University, shall belong to both Visvesvaraya Technological University, and the Karnataka State Pollution Control Board jointly (Shall be a joint claim of both KSPCB and VTU).

Memorandum of Understanding

Establishment of

“PARISARA CHAIR”

Jointly by

**Visvesvaraya Technological University
&
Karnataka State Pollution Control Board**

**29.08.2012
Bangalore**



**Visvesvaraya
Technological University,
Belgaum.**



**Karnataka State
Pollution Control Board,
Bangalore.**



Visvesvaraya Technological University

Jnana Sangama, Belgaum - 590 018

Dr. S Manjappa
Special Officer
Research & Development
Mob: +91 9844320294
e-mail: drsmdvg@gmail.com
No.VTU/SO/R&D/2012-13

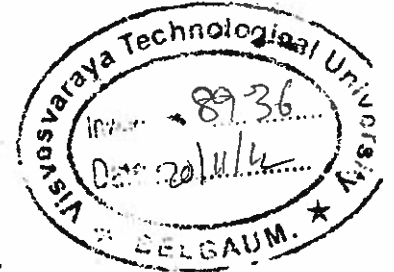
U B D T College of Engineering
Hadadi Road, Davangere - 577004
Karnataka, India
Tele Fax: +91 8192-221854 (O)
Phone: +91 8192-260294 (R)

Date: 07-11-2012

To,

The Registrar (Academic)
Visvesvaraya Technological University
Belgaum - 590 018.

Sir,



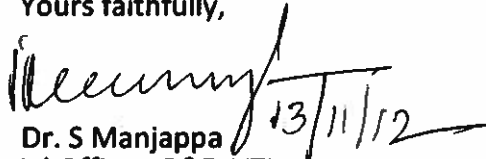
Sub: Establishment of Professorial Chair at VTU - reg.
Ref: MOU between VTU & KSPCB, Bangalore.

As you are aware of the fact that, Visvesvaraya Technological University and Karnataka State Pollution Control Board have jointly signed an MOU to establish Professorial Chair "Viz Parisara Chair" at Visvesvaraya Technological University, Belgaum on 29-08-2012 and document were exchanged by Hon'ble Vice-chancellor of the University and Chairman, Karnataka State Pollution Control Board in presence of the Hon'ble Higher Education Minister and Environmental Secretary and other dignitaries in a colorful function held at Bangalore. The copy of the document is enclosed for your kind reference. You are requested to bring the matter to the notice of the appropriate bodies for further action.

Hope that you will do the needful to take the programmes.

Thanking you,

Yours faithfully,


Dr. S Manjappa
Special Officer, R&D-VTU
Special Officer
(R&D - VTU)

U B D T College of Engineering
Davangere - 577 004

Received at the
Office of the Registrar

19 NOV 2012

PS
19/11



Memorandum of Understanding

between

Visvesvaraya Technological University (VTU), Belgaum

and



Karnataka State Pollution Control Board (KSPCB), Bangalore

Visvesvaraya Technological University (VTU) Belgaum represented by its Registrar and Karnataka State Pollution Control Board (KSPCB) Bangalore represented by its Member Secretary signed the memorandum of understanding on this day of 29th August, 2012 at Bangalore on the following terms to institute a professorial chair at Visvesvaraya Technological University (VTU), Belgaum at any one of Regional Offices of VTU / Constituent college of VTU.

- (1) VTU & KSPCB contributes Rs. 1.0 crore (Rupees one crore only) each and this contribution of Rs. 2.0 crores (Rupees two crores only) be kept as fixed deposit in any one of the Nationalized Bank in the name of 'Parisara Chair' at VTU. The interest earned out of the deposit may be used for the activities of the chair and its establishment charges.
- (2) KSPCB may identify the environment related problems and entrust the same to the Chair for investigations or for remedial solutions.
- (3) The Professorial Chair may identify the persons in the relevant field and co-ordinate with the KSPCB to complete the study entrusted to the chair.
- (4) Roles and functions/responsibilities of the chair shall be as indicated in Annexure.
- (5) The Search Committee shall select a suitable person/candidate and recommend for appointment by the Vice Chancellor, Visvesvaraya Technological University to the Professorial Chair.
- (6) The interest earned out of the fixed deposit be made use for the salary of the chair, one Assistant and contingency expenses for the activities of the chair.
- (7) The Chair will function from any one of the Regional Offices of VTU/constituent college of VTU.
- (8) The corpus created for setting up of the professorial chair shall not be utilized for any other purpose. However, the proceeds accrued out of corpus shall be utilized for the activities of the professorial chair as detailed above.

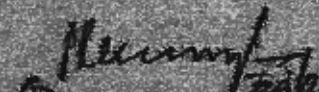

- (9) The proceeds from the corpus and all project related receipts shall be deposited in a separate account in the name of the chair and shall be operated by the professorial chair only and necessary books of accounts shall be maintained.
- (10) The annual accounts of the chair shall be audited by VTU by following the VTU norms and Audited report copy of the same shall be made available to the KSPCB.
- (11) The activities of the Chair shall be reviewed every six months jointly by KSPCB & VTU.
- (12) VTU shall provide the following facilities which are essential for the chair to conduct its activities.
- Furnished Office with internet connection along with office assistant and technical assistant.
 - Residential accommodation and Medical benefits as provided to other Professors of the University.
 - Access to Library, Computer Centre, Laboratories, Workshops, etc.
 - Dedicated Vehicle be provided to the chair for official travel and other institutional use.
- (13) IPR: All patent rights design and inventions derived, research results etc. during the period of stay at Visvesvaraya Technological University, 'Parisara Chair' Professor at Visvesvaraya Technological University, shall belong to both Visvesvaraya Technological University, and the Karnataka State Pollution Control Board jointly.

Accepted the above terms on behalf of Visvesvaraya Technological University, and Karnataka State Pollution Control Board.

 DR. S. MANJUNATH Visvesvaraya Technological University, VTU, Bangalore	 S.M. PUTTABUDDHI, IFS Member Secretary KSPCB, Bangalore S.M. Puttabudhi, IFS
--	--

Member Secretary,
 Karnataka State Pollution Control Board,
 Bangalore - 560 001

Witnesses

- (1) 
Dr. S. Manjunath
 20-VTU
 B D T College of Engineering
 Davangere - 577 004
- (2) 
C. Narayana Murthy
 Member, International Centre
 Karnataka State Pollution Control Board
 H. G. Road, Bangalore 560 001.

Karnataka State Pollution Control Board
 H. G. Road, Bangalore 560 001.

Memorandum of Understanding

Establishment of
“PARISARA CHAIR”

Jointly by
Visvesvaraya Technological University
&
Karnataka State Pollution Control Board

29.08.2012
Bangalore



**Visvesvaraya
Technological University,
Belgaum.**



**Karnataka State
Pollution Control Board,
Bangalore.**



Memorandum of Understanding

between

Visvesvaraya Technological University (VTU), Belgaum

&

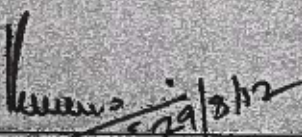
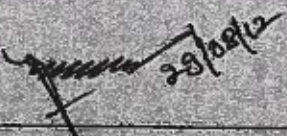
Karnataka State Pollution Control Board (KSPCB), Bangalore

Visvesvaraya Technological University (VTU) Belgaum represented by its Registrar and Karnataka State Pollution Control Board, (KSPCB) Bangalore represented by its Member Secretary signed the memorandum of understanding on this day of 29th August, 2012 at Bangalore on the following terms to institute a professorial chair at Visvesvaraya Technological University (VTU), Belgaum at any one of Regional Offices of VTU / Constituent college of VTU.

- (1) VTU & KSPCB contributes Rs.1.0 crore (Rupees one crore only) each and this contribution of Rs.2.0 crores (Rupees two crores only) be kept as fixed deposit in any one of the Nationalized Bank in the name of 'Parisara Chair' at VTU. The interest earned out of the deposit may be used for the activities of the chair and its establishment charges.
- (2) KSPCB may identify the environment related problems and entrust the same to the Chair for investigations or for remedial solutions.
- (3) The Professorial Chair may identify the persons in the relevant field and co-ordinate with the KSPCB to complete the study entrusted to the chair.
- (4) Roles and functions/responsibilities of the chair shall be as indicated in Annexure.
- (5) The Search Committee shall select a suitable person/candidate and recommend for appointment by the Vice Chancellor, Visvesvaraya Technological University to the Professorial Chair.
- (6) The interest earned out of the fixed deposit be made use for the salary of the chair, one Assistant and contingency expenses for the activities of the chair.
- (7) The Chair will function from any one of the Regional Offices of VTU/constituent college of VTU.
- (8) The corpus created for setting up of the professorial chair shall not be utilized for any other purpose. However, the proceeds accrued out of corpus shall be utilized for the activities of the professorial chair as detailed above.

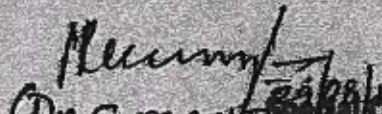

- (9) The proceeds from the corpus and all project related receipts shall be deposited in a separate account in the name of the chair and shall be operated by the professorial chair only and necessary books of accounts shall be maintained.
- (10) The annual accounts of the chair shall be audited by VTU by following the VTU norms and Audited report copy of the same shall be made available to the KSPCB.
- (11) The activities of the Chair shall be reviewed every six months jointly by KSPCB & VTU.
- (12) VTU shall provide the following facilities which are essential for the chair to conduct its activities,
- Furnished Office with internet connection along with office assistant and technical assistant.
 - Residential accommodation and Medical benefits as provided to other Professors of the University.
 - Access to Library, Computer Centre, Laboratories, Workshops, etc.
 - Dedicated Vehicle be provided to the chair for official travel and other institutional use.
- (13) IPR: All patent rights design and inventions derived, research results etc. during the period of stay at Visvesvaraya Technological University, 'Parisara Chair' Professor at Visvesvaraya Technological University, shall belong to both Visvesvaraya Technological University, and the Karnataka State Pollution Control Board jointly.

Accepted the above terms on behalf of Visvesvaraya Technological University, and Karnataka State Pollution Control Board.

 DR. S. MANJAPPA Visvesvaraya Technological University, BELGAUM VTU, Belgaum	 S.M. PUTTABUDDHI, IFS Member Secretary KSPCB, Bangalore S.M. Puttabudhi, I.F.S.
--	---

Member Secretary,
 Karnataka State Pollution Control Board,
 Bengaluru - 560 001

Witnesses

- (1) 
(Dr. S. MANJAPPA) Officer
 S.O. VTU, (R&D - VTU)
 U-B D T College of Engineering
 Davangere - 577 004
- (2) 
S. NANDA KUMAR

Senior Environmental Officer

Karnataka State Pollution Control Board
 11, G. Road, Bangalore - 560 001.



Annexure

Visvesvaraya Technological University (VTU), Belgaum - 590 018
and
Karnataka State Pollution Control Board (KSPCB), Bangalore - 560 001.
Establishment and Institution of "PARISARA CHAIR"
(PROFESSORIAL CHAIR)

1. INTRODUCTION:

Visvesvaraya Technological University (VTU), Belgaum is a premier technical University engaged in imparting quality education in Engineering, Science & Technology as well as in Research and Development in contemporary fields by affiliating more than 200 technical institutions in the State of Karnataka. With competent and well experienced faculty members of all disciplines in engineering and technology, Visvesvaraya Technological University, over the year has carved out a niche for itself amongst the best technical universities in India. The primary objective of the University is to produce competent engineers with an innovative bent of mind, offer high quality education, consultancy and testing services and generate new knowledge, through research and development, for the benefit of industry and society.

University now offers Engineering Undergraduate Programmes (4 year BE/B.Tech) and postgraduate programmes (2 years ME/M.Tech) including MBA and MCA and M.Sc (Engg) and also Doctoral programmes in major and emerging areas of Engineering, Science and Technology. Many R&D Programmes offered are need based and industry oriented projects.

The talent pool of the University comprises of more than 200 Institutions with nearly 20,000 faculty members and equal number of Technical supporting staff, the Visvesvaraya Technological University, is growing rapidly in recent years, in terms of academic programmes and Research activities. The University lays great importance on R&D activities, interaction with industries, consultancy and out-reach activities etc. In order to strengthen these activities further and to encourage research in thrust areas and interdisciplinary topics, Visvesvaraya Technological University plans to institute Professorial Chair in association with Karnataka State Pollution Control Board, Bangalore which is a statutory body to prevent, control and monitor the Environmental Pollution in the state of Karnataka. The Chair created by these two agencies will be effectively used to take up Specific projects related to Environmental Pollution Prevention and Control and Management.

2. ROLE OF PROFESSORIAL CHAIR:

The primary responsibilities of the Professorial Chair would be to coordinate projects concerning environmental issues in industries and elsewhere through KSPCB and VTU. This includes the following contractual obligations:

- To support Karnataka State Pollution Control Board, in evolving policy/standards for Environmental governance.
- To promote Interdisciplinary/Multi-disciplinary R&D work of interest to the Industry/Society and Karnataka State Pollution Control Board.
- To identify and create a data base of experts in engineering colleges affiliated to VTU having expertise in different areas of environmental issues and entrust them with projects of concern to industries.
- To identify centres of excellence in environmental related areas in engineering colleges affiliated to VTU and to entrust them with problems of concern to KSPCB.
- To support sponsoring agencies for organizing conferences/seminars, symposia/workshops etc.
- To take up pollution related problems, solving with the group of experts identifies by the chair.
- To take up regional carrying capacity studies including, monitoring and evaluation studies for cluster of industries.
- To establish state of art laboratory to cater to the need of industries.
- To capacity building of Academic Institutions/Organizations covered by KSPCB on environmental related issues.

With the above objectives the Professorial Chair crated is expected to contribute significantly to raise the level of R&D activities and Interaction with different stakeholders and also to bring in greater degree of professionalism in developing awareness to reduce the pollution due to developmental activities.

A Professorial Chair can be created at its Head Quarters or in any one of the regional centers of the university or in its constituent college viz., UBDT College of Engineering, Davangere.

The Karnataka State Pollution Control Board may identify such of the problems required which can be entrusted the chair like pollution monitoring environmental status report preparation, water and air quality monitoring etc.

3. FINANCIAL ASPECTS FOR PROFESSORIAL CHAIR:

To start the professorial chair, Visvesvaraya Technological University and Karnataka State Pollution Control Board, shall contribute Rs. 1.0 crore (Rupees one crore only) each as corpus to establish the same and Interest earned out of the deposit may be used for meeting the salary, contingency expenses for the professorial chair. Any agency / industry may contribute additionally to the expenses of extra staff and consumables required for assigned projects from stakeholders. As per the present Government of India rules all contributions to the Universities by sponsors are eligible for 100% tax exemption under section 80G of Indian Income tax rules.

4. GUIDELINES FOR MOU:

The MoU to be signed between Visvesvaraya Technological University and Karnataka State Pollution Control Board should specify the following:

- The model for the Professorial Chair
- The Department/Centre to which the Professor would be attached
- The desired broad fields of activity of expertise for the Professorship
- The Search Committee to identify the person for the Parisara Chair

The proposal for instituting a Chair Professorship may be initiated by the Visvesvaraya Technological University or Karnataka State Pollution Control Board. If the proposal is acceptable, steps would be taken to get it approved and sign an MoU with the sponsoring organization. The MoU will specify the members of the Search Committee which would include:

- (1) Chairman KSPCB as chairman of selection committee:
 - (i) Registrar of the University.
 - (ii) Member Secretary of KSPCB.
 - (iii) Special Officer (R&D).
 - (iv) One eminent person from the industry (nominated by KSPCB).
 - (v) One eminent person from Academic/R&D institution (Nominated by VTU) as members of Selection committee.

The Search Committee shall select a suitable three persons/candidates recommend for appointment of one by the Vice Chancellor, Visvesvaraya Technological University to Professorial Chair. However, first appoint can be made by Vice Chancellor in consultation with Chairman, KSPCB.

Designation: The person appointed against the Chair Professorship will be called "VTU Parisara Chair Professor".

Eligibility: Any person with a proven track record as an outstanding teacher (in the rank of Professor of researcher) with PhD/Master Degree in Environment field and significant R&D practical experience be eligible for appointment to the Visvesvaraya Technological University, Parisara Professorship. He/she shall be a reputed researcher/ scholar/ scientist/ professional in the field of Environmental Pollution and Control and shall have relevant experience with a strong publication in Environmental Pollution monitoring and control.

Salary & Benefits: The salary/honorarium of the Visvesvaraya Technological University, Parisara Chair Professor would be met out of the interest earned from the corpus fund created by Visvesvaraya Technological University and Karnataka State Pollution Control Board.

Visvesvaraya Technological University, also provides:

- Furnished Officer Room with internet connection along with office assistant and technical assistant.
- Residential accommodation as provided to other Professors of the University.
- Access to Library, Computer Centre, Laboratories, Workshops, etc.
- Medical benefits as provided to any Professor of University.
- Dedicated Vehicle be provided to the chair for official travel and other institutional use.

IPR: All patent rights of design inventions, research results etc. derived out of the projects, if any, during the period of appointment of Parisara Chair Professor at Visvesvaraya Technological University, shall belong to both Visvesvaraya Technological University and the Karnataka State Pollution Control Board jointly. (Shall be a joint claim of both KSPCB and VTU).

MEMORANDUM OF UNDERSTANDING

Between

Construction Industry Development Council, New Delhi

And



Visvesvaraya Technological University, Belgaum

This Memorandum of Understanding (MoU) is signed on 2nd June 2014 between **Construction Industry Development Council** having its registered office at **801 Hemkunt Chambers, 89 Nehru Place, New Delhi-110019** hereinafter called the "**First Party**" (which expression shall, unless repugnant to the context, includes its successors and assignees of the First Party).

AND

The Visvesvaraya Technological University having its registered office at "**Jnana Sangama**", Belgaum and hereinafter called the "**Second Party**" (which expression shall, unless repugnant to the context, include its successors and assignees of the "Second Party").

WHEREAS, the First Party has launched a scheme for training and education of personnel at various levels, starting from Workers / Supervisors training Diploma / Post Diploma Programmes in Construction Engineering and other fields, extending to the higher levels.

WHEREAS, the First Party has initiated a Human Resource Development scheme for construction industry under which competency standards, training methods and course materials, syllabi, testing and certification procedures etc have been developed by CIDC tailored to the requirements of the Construction Industry and are approved by Ministry of Labour / SBTE / University as in force from time to time. The actual training and testing is to be conducted at "**CIDC Accredited Centres**" in the premises of and with the resources of Partner Institution (PI) situated at VTU Regional Centres.

AND WHEREAS, the Second Party is desirous of becoming one of the Partner Institutions (PI) under the said CIDC scheme for Training and HRD for Construction Industry, and agrees to set up a "**CIDC Accredited Centre/s**" at its Regional Centres located at Belgaum, Bangalore, Mysore and Gulbarga, for carrying out the above mentioned training in its premises with its own resources.

↙

Kepa

VTU has embarked on a project of National Importance to impart vocational and professional training leading to employment of unemployed youth from the state of Karnataka.

In this context they have joined hands with Several National Organizations & are now desirous of joining hands with Construction Industry Development Council, New Delhi, who are the apex organizations, established by the Planning Commission, Government of India, and are engaged in developing human resources for Construction Industry for last two decades, and have enquired substantial experience in this field. This association envisages following role for the two parties.

VTU : Vocational Training Provider & Partner Institution.
CIDC : Intellectual partner & mentor for this initiative.

The detailed role & responsibilities of the two parties are defined in the succeeding clauses of this MoU.

AND WHEREAS, the Second Party already meets (or agrees to take action to meet, within a reasonable period) the Eligibility Criteria for being nominated as Partner Institution as set out by the First Party;

AND WHEREAS, the First Party has agreed to appoint the Second Party as Partner Institution (PI) under the said scheme;

NOW, THE FIRST AND SECOND PARTIES herein and hereby agree to collaborate for the purpose of initiating, developing and implementing programmes of education and training of construction personnel with the Second Party being given the status of a Partner Institution (PI) and the Second Party agreeing to utilize its resources for conducting such training.

RESPONSIBILITIES:

A. FIRST PARTY:

The First Party hereby authorizes (subject to payment of relevant fees & dues by Second Party to First Party) the second party. to act as their Partner Institution for a period of 3 years initially, extendable to such periods as are approved by the first party from time to time.

The First Party is responsible for providing the syllabi, curricula of the programs to be offered by the Second Party. Annexure – I would be treated as an integral part of this MoU & details the trades to be offered under this associations.

The Second Party will not add to, subtract from or substitute all or any of the above at a future date or alter the duration of training and / or number of trainees in its training courses without the approval of the First Party. In all matters concerning training, testing and certification under this scheme, the First Party shall provide the systems and procedures.



The first Party shall conduct examinations and issue certificates, to the successful candidates trained under the approved programs. For all such examination the Second Party shall pay a fee of Rs 2500/- per candidate to First Party.

B. SECOND PARTY :

The Second Party having paid & committed to pay, respectively, a sum of Rupees Five Lakh only (Rs. 500,000/-) to the First Party for becoming a Partner Institution as the one time appointment fee & thereafter an annual renewal fee of Rupees Sixty thousand only (Rs. 60,000/-) per year on or before 31st July of the respective year from the second year onwards.

The Second Party shall ensure that all training is conducted in conformity with the standards, norms, methods approved under the CIDC scheme for training and education in construction. To assist such training, first party shall train the trainers of the Second Party from time-to-time, on chargeable basis. In addition, the First Party shall depute one observer with the Second Party who will oversee the training programs conditions. The observer shall be stationed at the respective Regional Centres of VTU and conduct the observation work on a regular basis. The cost of such observers, including their salary boarding & lodging and out of pocket expenses shall be borne by the Second Party. This cost shall be reimbursed to the first party on a regular basis.

The second party shall also strive to bring in regulatory inclusions, as advised by the first party from time to time to further the expansion of this program.

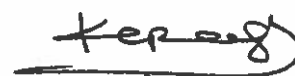
The Second Party shall ensure the provision of minimum number of trainees, resources of space, manpower, equipment, material and other facilities as directed by the First Party. In this connection, the Second Party will furnish relevant information as required by the First Party and facilitate initial and subsequent inspection of their facilities.

Other areas of Cooperation

1. VTU has resolved to make the Internship as an integral part of Engineering & management education both at Diploma / Degree level, to enhance the value additions & quality upliftment & desires to seek the support of CIDC & their associated professional bodies in furtherance of this program.

To achieve this VTU shall, through a directive, communicate with their affiliated Institutions, engineering & management education, to seek help of CIDC & become their partner institution for this purpose, as per their standard terms.

2. VTU shall, to spread engineering education among the personnel working with the Construction & Engineering Industry, shall offer such short / long term programs in engineering disciplines, under Industry – Academia Partnership, leading to competency



certificates, special diplomas, & degrees, as may be useful to the Industry through conventional & nonconventional modes.


Separate MoU's would be entered for this purpose.

This MoU is approved subject to the affirmation of the Legal Counsel of VTU.

TERMINATION:

This MoU could be terminated by giving a notice of 6 months from either side, however the first right of refusal / acceptance shall be that of the first party. In witness we set our hands to this Memorandum of Understanding.


First Party


Dr. P. R. Swarup
Director General
Construction Industry Development Council
New Delhi



Witnesses:

First Party

1. 
(Signature)

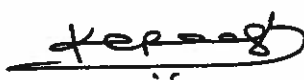
S. J. AMALAN
(Name)

Chief Skill Advisor
(Designation)

(Organisation)


(Address) 1, Yash Chavac Enclave, P-II
2nd Cross, Hebbur Main Road
Bangalore - 560043

Second Party


Dr. K. E. Prakash
Registrar
Visvesvaraya Technological University
'Jnana Sangama', Belgaum



Second Party

1. 
(Signature)

Dr. D. H. RAO
(Name)

Dean
(Designation)

VTU
(Organisation)

(Address) "Jnana Sangama"
Machhe, Belgaum
590 018

Date: 02-06-2014

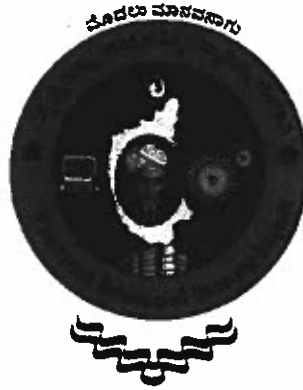
Place: 'Jnana Sangama', Belgaum

Memorandum of Understanding (MoU)

Between



**DESHPANDE
FOUNDATION**



Visvesvaraya Technological University (VTU)

To Develop

LEaders Accelerating Development (LEAD) Program of Deshpande Foundation (DF) for students in VTU and its affiliated institutes

Deshpande Foundation ("DF"). A registered Charitable trust established on 29 October 2007, located in Hubli District, Karnataka state, INDIA, sub registered by the Government of Karnataka, Bangalore.

And

Visvesvaraya Technological University (VTU), a Collegiate public state university in Karnataka State, India, established on 1 April 1998 by the Government of Karnataka as per *VTU Act 1994*

have executed this Memorandum of Understanding on Saturday, 27th September, 2014 for the purpose of promoting mutual understanding and enhancing the development of long-term, comprehensive and professional cooperation between VTU and DF.

Through professional interactions, on the basis of a peer-to-peer relationship and mutual benefit, the Parties hereby enter into this MOU to establish a strategic partnership in several areas outlined below.

MoU Between VTU and DF



Page 1 of 4

1 Preamble & Objectives

Deshpande foundation is the leading global non-profit organisation operates to create an effective ecosystem where resources are put to use through entrepreneurship, innovation and sustainability. The Deshpande Centre established at Massachusetts Institute of Technology (MIT) has helped spur the creation of 28 spinout companies, which have raised over \$400 million in capital in outside financing. The centre has funded more than 90 projects with over \$11 million grant. The Deshpande Foundation India - Hubli Sandbox works to create an effective ecosystem where resources are put to use through entrepreneurship, innovation and sustainability. To date, it has helped over 20 entrepreneurs to create scalable businesses. In other initiatives like LEaders Accelerating Development (LEAD) program, more than 21,000 students from 75+ collages contributed for implementation of over 5000 projects in three states. Through such programs, we strive to launch effective, relevant and scalable solutions through the investment in enterprises to create positive change in the world. We have already reached and improved lives of over one million families in one or other ways. We are **Building an Ecosystem that Nurtures Innovation and Entrepreneurship Globally.**

Visvesvaraya Technological University (VTU), named after Bharat Ratna Sir. M. Visvesvaraya is an institution that is rich in history, academic excellence, and leadership. VTU is one of India's leading and largest technical Universities having 201 affiliated engineering colleges and several PG programs. Every year VTU graduates over 79,000 students who are the next generation technical leaders, thinkers, innovators and scholars towards meeting this objective.

The purpose of the relationship between LEAD and students of VTU and its affiliated institutions will be, to explore possibilities for collaboration, and to partner on various students initiated projects. LEAD Campus/Cell is a platform for group of college students that helps students to generate innovative ideas, develop initiative approach and creative thinking, plan activities, organizing guest speaker's sessions and trainings.

This agreement recognizes that LEAD is a unique college students' development program fostering Innovation and Initiation among the college students. LEAD aims at "building the nation of young LEADers", who can bring innovative solutions to the problems that they come across. LEAD provides intensive trainings through camps to these students to improve their communication, presentation, IT, innovation and initiation skills, building their own networks etc. LEAD has its existence in more than 75 colleges covering 14 districts of Karnataka, Maharashtra, Andhrapradesh and Tamilnadu.

LEAD has been running in several VTU affiliated colleges in North Karnataka and has provided the platform for the students to work on social and technological innovation to solve the local problems and build their leadership skills and innovative approach. LEAD through its innovative way has helped students to realized their leadership potential during their colleges days. LEAD is working with BVB, SDM, GIT, KLECET, KLEIT, BLDA, BIET, UBDT, SJMIT, GEC and other 40 colleges from North Karnataka from last 3-4 years and have impact on 21,276 students from its inception.

The goal of LEAD is to provide a conduit for the LEADing students, and develop solutions to social issues. Through this valuable agreement LEAD will ignite the spark of innovation in 6000+ students every year and develop those useful projects for betterment of society which will not be possible otherwise.



2 Mandate of the LEaders Accelerating Development (LEAD) Program for the Deshpande Foundation (DF) under this MoU

During the term of this MoU, DF may make following contributions under LEAD program:

- 2.1 Set up LEAD (LEaders Accelerating Development) in collaboration with VTU to run in all the affiliated colleges of VTU. LEAD can be announced for all the VTU affiliated colleges in collaboration with VTU and an official circular will be sent by VTU for LEAD program. All the affiliated colleges students shall be given access to the MIS of LEAD program to apply, get updates and communication in regards to their innovative leadership ideas/projects.
- 2.2 Provide financial assistance to students' led selected LEAD projects of students as per the guidelines of the Deshpande Foundation.
- 2.3 Based on students' active participation and entrepreneurial eagerness we (DF) shall provide entrepreneurship mentorship & incubation support to the innovative ideas.

3 Mandate of the LEaders Accelerating Development (LEAD) Program for the Visvesvaraya Technological University (VTU) under this MoU

During the term of this MoU, VTU may make following contributions under LEAD program:

3.1 Providing necessary infrastructure

- 3.1.1 Assist DF to implement LEAD (LEaders Accelerating Development) program and other activities mentioned by DF in earlier section of this mandate.
- 3.1.2 Provide following infrastructure to setup LEAD (LEaders Accelerating Development) program
 - i. Accommodation facility for LEAD management team for overnight stay, meetings and other activities necessary to carry out the program
 - ii. Broadband Internet connection
 - iii. Necessary furniture, lighting and cooling arrangements
 - iv. Drinking water facility
 - v. Electricity and backup arrangement in case of mains failure, and
 - vi. Independent washrooms and toilet.

3.2 Assist DF to establish LEAD Cells in all the VTU regional centres and constituent colleges, and provide basic facilities and one staff involvement as LEAD Coordinator.

3.3 Financial support may be provided to 10 students from each VTU regional PG Centres for the LEAD Prayana (a 2 weeks annual Leadership Journey) to build the leadership/entrepreneurship ability, through selection process laid by the LEAD team. VTU may extend this to its affiliated colleges, at its discretion.



4 Joint Collaboration and Promotion

- 4.1 DF and VTU shall jointly promote the object of the MOU, through the standard print orders and materials for circulation of policy document in the VTU, its affiliated collages.
- 4.2 DF and VTU shall jointly issue certificate to students participating in LEAD program upon successful completion of program as per rules and regulations set by LEAD team.
- 4.3 DF and VTU shall jointly do a press conference to announce the partnership.
- 4.4 VTU shall send an intimation and information about the processes of the LEAD (LEaders Accelerating Development) program covered under this MOU to all its affiliated colleges.

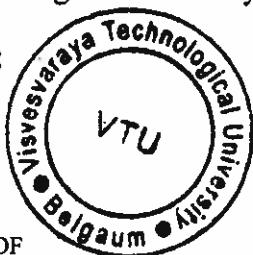
5 Terms and Termination

- 5.1 This MoU is valid for a period of three (3) years from the date of signing of this MoU and is renewed subsequently by mutual consent for additional 3 year terms
- 5.2 The terms of this Agreement shall commence as set-forth above and remain in effect until
 - 5.2.1 Either party communicates to terminate this Agreement or otherwise superseded by another.
 - 5.2.2 Both parties agree to give the other 90 days written notice of their intent to terminate this Agreement.
 - 5.2.3 Upon termination of this Agreement, any VTU student who is selected for project will be authorised to communicate and continue taking further support from both parties if needed, and
 - 5.2.4 Any changes to the MoU are to be mutually agreed to by DF and VTU and duly executed in writing.

This agreement shall become effective from Saturday, 27th September, 2014 upon signing of this MoU.



Dr. H. Maheshappa
Vice-Chancellor
Visvesvaraya Technological University
"JnanaSangama"
Belgaum – 590 018
Karnataka, India.




Naveen Jha
CEO – Deshpande Foundation
Deshpande Centre for Social Entrepreneurship
Building, BVB College of Engineering and
Technology, Vidyanagar, Hubli - 580 031
Karnataka, India.



Memorandum of Understanding (MOU)
Between



**Deshpande
Foundation**

&



Visvesvaraya Technological University (VTU)

For

**Collaboration between VTU and Sandbox Startups – Technology
Business Incubator**

Deshpande Foundation (Hereafter referred to as DF) a registered Charitable trust established on 29 October 2007, located in Hubballi District, Karnataka state, India, sub registered by the Government of Karnataka, Bangalore.

And

Visvesvaraya Technological University (Hereafter referred to as VTU), a Collegiate public state university in Karnataka State, India, established on 1 April 1998 by the Government of Karnataka as per VTU Act 1994

have executed this Memorandum of Understanding on 31st Day of December 2015 for the purpose of promoting mutual understanding and enhancing the development of long-term, comprehensive and professional cooperation between VTU and DF (Hereafter referred to as Parties). Through professional interactions, on the basis of a peer-to-peer relationship and mutual benefit, the Parties hereby enter into this MOU to establish a strategic partnership in several areas outlined under following

1 Preamble and Objectives

DF is the leading global non-profit organisation operates to create an effective ecosystem where resources are put to use through entrepreneurship, innovation and sustainability. DF has launched "Sandbox Startups" in order to support mission driven entrepreneurs with innovative business ideas. While other incubation centres located in tier-I city focusing on attracting high-tech and high growth startups, the Sandbox Startups at Hubballi has proved to be useful for entrepreneurs to test products, conduct pilots, build prototypes and validate markets. Till date, Sandbox Startups has trained over 100 entrepreneurs through various activities and nurtured over 30 ventures through customized incubation support, now creating large social and economic impact.

Visvesvaraya Technological University (VTU), named after Bharat Ratna Sir. M. Visvesvaraya is an institution that is rich in history, academic excellence, and leadership. VTU is one of India's leading and largest technical Universities having 201 affiliated engineering colleges and several PG programs. Every year VTU graduates over 79,000 students who are the next generation technical leaders, thinkers, innovators and scholars towards meeting this objective.

VTU and DF are desirous of coming together with the common objective to promote innovation and entrepreneurship, among current students and alumni ("students") and support incubated entrepreneurs ("Incubatees") in Sandbox Startups - Technology Business Incubator ("Sandbox Startups - TBI" or "TBI"). The Deshpande Foundation and VTU enter in to this MOU to establish a partnership under activities of Sandbox Startups TBI.

2 Objectives of Sandbox Startups - TBI:

The Sandbox Startups - TBI aims to

- i. Support entrepreneurs with innovative ideas through its incubation and co-working space,
- ii. Create nurturing ecosystem that will help entrepreneurs to prototype, test and commercialize new technologies,
- iii. Build a support system viz. legal, financial, IPR etc., and
- iv. Forge partnerships with academia, industry, financial institutions and government to provide better opportunities to incubatees.

Kepaag

REGISTRAR

Visvesvaraya Technological University,
MOU Between DF and VTU
BELGAUM

For DESHPANDE FOUNDATION

[Signature]
CHIEF EXECUTIVE OFFICER

3 Mandate of the Sandbox Startups -TBI under this MOU

During the term of this MOU, Sandbox Startups -TBI shall make following contributions:

- 3.1 Support VTU student entrepreneurs by providing feedback and on-going mentorship at every stage as needed such as - product & technology mentoring, Go-To-Market strategies, and
- 3.2 Allow access to selected VTU students for using Prototyping Lab facility to develop, pilot and test new products at Sandbox Startups –TBI located at Hubballi, Karnataka.

4 Mandate of the Visvesvaraya Technological University (VTU) under this MOU

During the term of this MOU, VTU shall nominate Vice Chancellor as member to the Board of Governors of Sandbox Startups – TBI and shall make following contributions:

- 4.1 Provide access to lab facilities to incubatees in Sandbox Startups – TBI, and
- 4.2 Extend technological expertise of VTU faculty to Sandbox Startups – TBI incubatees.

5 Terms and Termination

This MOU is valid for a period of ten (10) years from the date of signing of this MOU and shall be renewed on mutually agreeable terms and conditions.

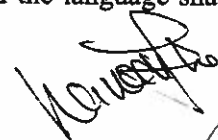
6 Confidentiality

The Parties acknowledge that, in the course of their negotiations under this MOU, it may be necessary for one Party to provide documentation, technical and business information and/or intellectual property, in whatever form recorded (collectively, "Confidential Information"), to the other Party. All Confidential Information provided or disclosed by either Party hereunder shall remain the property of the furnishing party, and shall be held in strict confidence by the receiving Party, unless the furnishing Party otherwise consents in writing or unless disclosure of such Confidential Information is required by the applicable laws. Confidential Information furnished by any Party hereunder

7 Dispute Resolution

In case of differences that are not ruled by this MOU, the Parties agree to find an amicable and mutually acceptable solution. Should the Parties fail to do so, all disputes arising in connection with this MOU shall be referred to arbitration and the arbitration shall be conducted by a sole arbitrator appointed jointly by the Parties in accordance with the provisions of the Arbitration and Conciliation Act 1996, as amended from time to time, and the venue shall be at Hubballi district, Karnataka state, India and the language shall be in English.


REGISTRAR
Visvesvaraya Technological University
BELGAUM





8 Indemnity

Neither Party will be liable to indemnify the other Party, and/or its employees from and against all costs, claims, demands, liabilities, expenses, damages or losses arising while executing the activities defined in this Agreement or in connection with a Party's negligence or breach of the terms of this Agreement

9 Notices

Any notice or other writing required or permitted to be given hereunder or for the purposes hereof to any Party shall be sufficiently given if provided in English language and delivered personally or if transmitted by fax or other form of recorded communication tested prior to transmission to such Party:

In the case of notice to Deshpande Foundation, at:

For the attention of:

Mr. Naveen Jha,

Chief Executive Officer, Deshpande Foundation,

DCSE Building, BVBCET Campus, Vidyanagar, Hubballi 580031, Karnataka

Phone number: 91-836-2378500

Fax number: 91-836-2378501

Email: naveen@deshpandefoundation.org

In the case of notice to the VTU, at:

For the attention of:

Vice Chancellor, Visvesvaraya Technological University,

"Jnana Sangama", Belagavi - 590 018, Karnataka

Phone number: 0831-2498224

Fax number: 0831-2405467

Email: vc@vtu.ac.in

The notice shall be deemed to be effective upon the actual date of delivery supported by the requisite proof of delivery

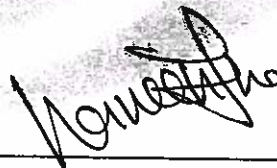
10 Governing Law:

This MOU shall be governed by laws of India and the parties submit themselves to the jurisdiction of the courts in Hubballi/Belagavi district, Karnataka state, India.

This agreement shall become effective from Thursday, 31st December, 2015 upon signing of this MOU.



Dr. K. E. Prakash
Registrar,
Visvesvaraya Technological University,
"Jnana Sangama", Belagavi - 590 018,
Karnataka, India.

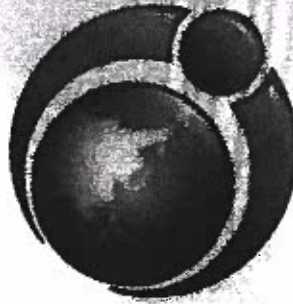


Mr. Naveen Jha
CEO - Deshpande Foundation,
Deshpande Centre for Social Entrepreneurship
Building, BVBCET Campus, Vidyanagar,
Hubballi - 580 031, Karnataka, India.



Memorandum of Understanding (MOU)

Between



**Deshpande
Foundation**

&



Visvesvaraya Technological University (VTU)

To

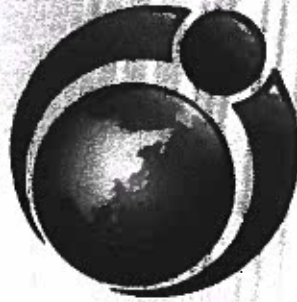
**Collaboration between VTU and Sandbox Startups – Technology
Business Incubator**

Naveen Jha
Mr. Naveen Jha
CEO, Deshpande Foundation
Deshpande Centre for Social Entrepreneurship Building,
BVBCEF Campus, Vidyanagar, Hubballi - 580 031,
Karnataka, India.



Prakash
Dr. K. E. Prakash
Registrar,
Visvesvaraya Technological University,
"Jana Sangama", Belagavi - 590 018,
Karnataka, India.

**Memorandum of Understanding (MOU)
Between**



**Deshpande
Foundation**

&



Visvesvaraya Technological University (VTU)

For

**Collaboration between VTU and Sandbox Startups – Technology
Business Incubator**

Deshpande Foundation (Hereafter referred to as DF) a registered Charitable trust established on 29 October 2007, located in Hubballi District, Karnataka state, India, sub registered by the Government of Karnataka, Bangalore.

And

Visvesvaraya Technological University (Hereafter referred to as VTU), a Collegiate public state university in Karnataka State, India, established on 1 April 1998 by the Government of Karnataka as per VTU Act 1994

have executed this Memorandum of Understanding on 31st Day of December 2015 for the purpose of promoting mutual understanding and enhancing the development of long-term, comprehensive and professional cooperation between VTU and DF (Hereafter referred to as Parties). Through professional interactions, on the basis of a peer-to-peer relationship and mutual benefit, the Parties hereby enter into this MOU to establish a strategic partnership in several areas outlined under following

1 Preamble and Objectives

DF is the leading global non-profit organisation operates to create an effective ecosystem where resources are put to use through entrepreneurship, innovation and sustainability. DF has launched "Sandbox Startups" in order to support mission driven entrepreneurs with innovative business ideas. While other incubation centres located in tier-I city focusing on attracting high-tech and high growth startups, the Sandbox Startups at Hubballi has proved to be useful for entrepreneurs to test products, conduct pilots, build prototypes and validate markets. Till date, Sandbox Startups has trained over 100 entrepreneurs through various activities and nurtured over 30 ventures through customized incubation support, now creating large social and economic impact.

Visvesvaraya Technological University (VTU), named after Bharat Ratna Sir. M. Visvesvaraya is an institution that is rich in history, academic excellence, and leadership. VTU is one of India's leading and largest technical Universities having 201 affiliated engineering colleges and several PG programs. Every year VTU graduates over 79,000 students who are the next generation technical leaders, thinkers, innovators and scholars towards meeting this objective.

VTU and DF are desirous of coming together with the common objective to promote innovation and entrepreneurship, among current students and alumni ("students") and support incubated entrepreneurs ("Incubatees") in Sandbox Startups – Technology Business Incubator ("Sandbox Startups – TBI" or "TBI"). The Deshpande Foundation and VTU enter in to this MOU to establish a partnership under activities of Sandbox Startups TBI.

2 Objectives of Sandbox Startups - TBI:

The Sandbox Startups - TBI aims to

- i. Support entrepreneurs with innovative ideas through its incubation and co-working space,
- ii. Create nurturing ecosystem that will help entrepreneurs to prototype, test and commercialize new technologies,
- iii. Build a support system viz. legal, financial, IPR etc., and
- iv. Forge partnerships with academia, industry, financial institutions and government to provide better opportunities to incubatees.

Kepang

REGISTRAR

Visvesvaraya Technological University
BELGAUM

MOU Between DF and VTU

Kavaythe



3 Mandate of the Sandbox Startups -TBI under this MOU

During the term of this MOU, Sandbox Startups -TBI shall make following contributions:

- 3.1 Support VTU student entrepreneurs by providing feedback and on-going mentorship at every stage as needed such as - product & technology mentoring, Go-To-Market strategies, and
- 3.2 Allow access to selected VTU students for using Prototyping Lab facility to develop, pilot and test new products at Sandbox Startups –TBI located at Hubballi, Karnataka.

4 Mandate of the *Visvesvaraya Technological University (VTU)* under this MOU

During the term of this MOU, VTU shall nominate Vice Chancellor as member to the Board of Governors of Sandbox Startups – TBI and shall make following contributions:

- 4.1 Provide access to lab facilities to incubatees in Sandbox Startups – TBI, and
- 4.2 Extend technological expertise of VTU faculty to Sandbox Startups – TBI incubatees.

5 Terms and Termination

- 5.1 This MOU is valid for a period of five (5) years from the date of signing of this MOU, the terms of this Agreement shall commence as set-forth above and remain in effect until
 - 5.1.1 Both parties agree to give the other 90 days written notice of their intent to terminate this Agreement,
 - 5.1.2 Upon termination of this Agreement, any VTU student entrepreneur who is selected for incubation will be authorised to communicate and continue taking further support from both parties if needed, and
 - 5.1.3 Any changes to the MOU are to be mutually agreed to by DF and VTU and duly executed in writing.

6 Confidentiality

The Parties acknowledge that, in the course of their negotiations under this MOU, it may be necessary for one Party to provide documentation, technical and business information and/or intellectual property, in whatever form recorded (collectively, "Confidential Information"), to the other Party. All Confidential Information provided or disclosed by either Party hereunder shall remain the property of the furnishing party, and shall be held in strict confidence by the receiving Party, unless the furnishing Party otherwise consents in writing or unless disclosure of such Confidential Information is required by the applicable laws. Confidential Information furnished by any Party hereunder

7 Dispute Resolution

In case of differences that are not ruled by this MOU, the Parties agree to find an amicable and mutually acceptable solution. Should the Parties fail to do so, all disputes arising in connection with this MOU shall be referred to arbitration and the arbitration shall be conducted by a sole arbitrator appointed jointly by the Parties in accordance with the provisions of the Arbitration and Conciliation Act 1996, as amended from time to time, and the venue shall be at Hubballi district, Karnataka state, India and the language shall be in English.

REGISTRAR

Visvesvaraya Technological University,
BELGAUM

8 Indemnity

Neither Party will be liable to indemnify the other Party, and/or its employees from and against all costs, claims, demands, liabilities, expenses, damages or losses arising while executing the activities defined in this Agreement or in connection with a Party's negligence or breach of the terms of this Agreement

9 Notices

Any notice or other writing required or permitted to be given hereunder or for the purposes hereof to any Party shall be sufficiently given if provided in English language and delivered personally or if transmitted by fax or other form of recorded communication tested prior to transmission to such Party:

In the case of notice to Deshpande Foundation, at:

For the attention of:

Mr. Naveen Jha,

Chief Executive Officer, Deshpande Foundation,

DCSE Building, BVBCET Campus, Vidyanagar, Hubballi 580031, Karnataka

Phone number: 91-836-2378500

Fax number: 91-836-2378501

Email: naveen@deshpandefoundation.org

In the case of notice to the VTU, at:

For the attention of:

Vice Chancellor, Visvesvaraya Technological University,

"Jnana Sangama", Belagavi - 590 018, Karnataka

Phone number: 0831-2498224

Fax number: 0831-2405467

Email: vc@vtu.ac.in

The notice shall be deemed to be effective upon the actual date of delivery supported by the requisite proof of delivery

10 Governing Law:

This MOU shall be governed by laws of India and the parties submit themselves to the jurisdiction of the courts in Hubballi/Belagavi district, Karnataka state, India.

This agreement shall become effective from Thursday, 31st December, 2015 upon signing of this MOU.



Dr. K. E. Prakash
Registrar,
Visvesvaraya Technological University,
"Jnana Sangama", Belagavi - 590 018,
Karnataka, India.

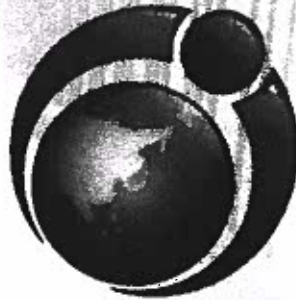




Mr. Naveen Jha
CEO - Deshpande Foundation,
Deshpande Centre for Social Entrepreneurship
Building, BVBCET Campus, Vidyanagar,
Hubballi - 580 031, Karnataka, India.

Memorandum of Understanding (MOU)

Between



**Deshpande
Foundation**


&



Visvesvaraya Technological University (VTU)

To

**Collaboration between VTU and Sandbox Startups – Technology
Business Incubator**

Naveen Jha

Mr. Naveen Jha
CEO, Deshpande Foundation
Deshpande Centre for Social Entrepreneurship Building,
BVBCET Campus, Vidyanagar, Hubballi - 580 031,
Karnataka, India.

K. E. Prakash
Dr. K. E. Prakash
Registrar,
Visvesvaraya Technological University,
"Jnana Sangama", Belagavi - 590 018,
Karnataka, India.

(10)

**MEMORANDUM OF UNDERSTANDING
BETWEEN**

AUTODESK ASIA PTE LTD

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM

This MEMORANDUM OF UNDERSTANDING ("MOU") sets forth certain binding and non-binding understandings, is effective as of the later of the dates in the signature block ("Effective Date"), and is made and entered into by and between VISVESVARAYA TECHNOLOGICAL UNIVERSITY ("COLLABORATOR") and AUTODESK ASIA PTE. LTD. ("AUTODESK").

A. PURPOSE:

The purpose of this MOU is to begin and/or to expand a framework of cooperation between COLLABORATOR and AUTODESK to support and/or develop educational programs, curricula, projects, and/or activities related to promoting, teaching or instruction in the use of AUTODESK software as more fully described in Exhibit A ("Purpose").

B. PROPOSAL

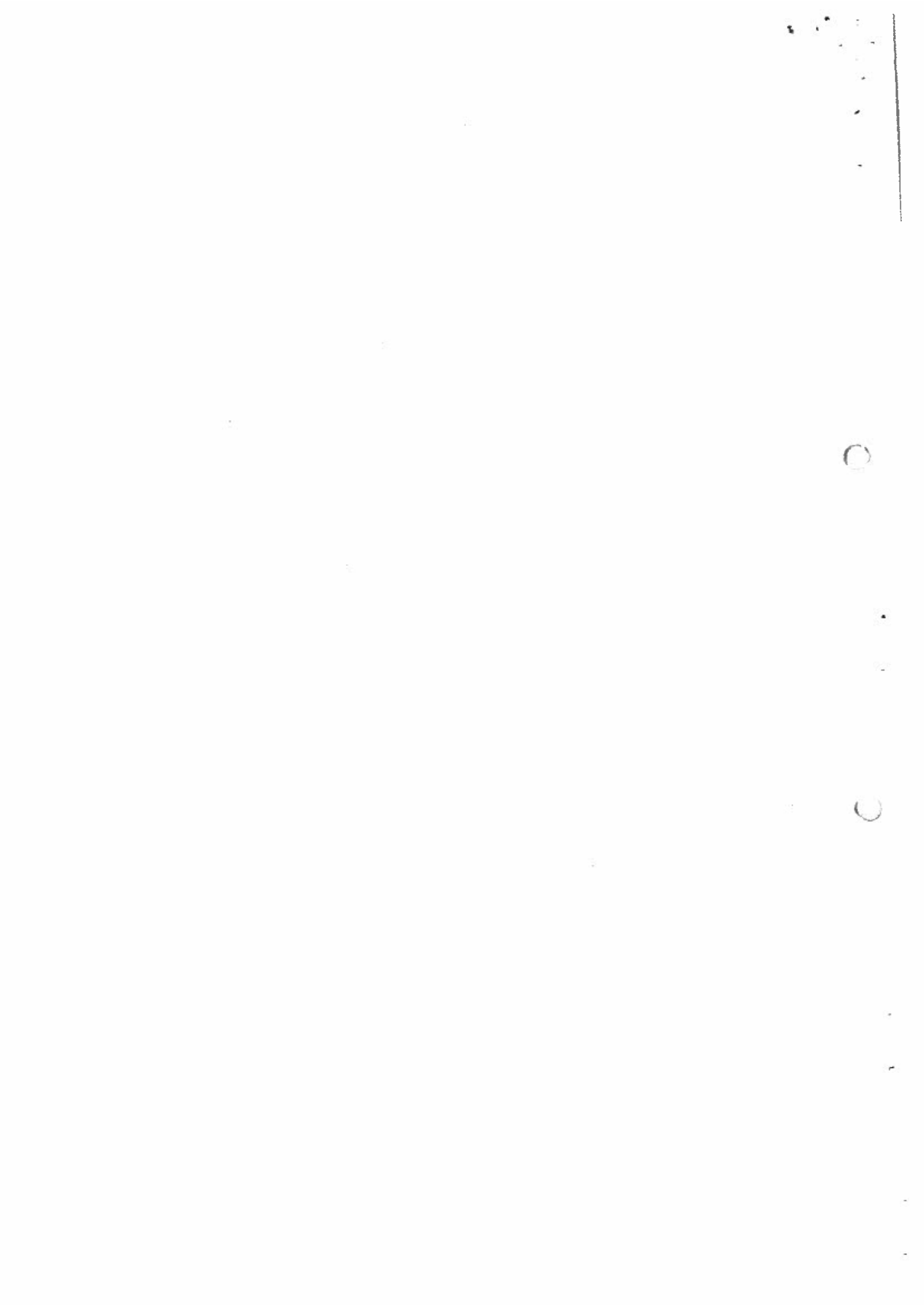
AUTODESK has submitted a detailed proposal ("Proposal") to COLLABORATOR on the program of Design education of Engineering & Architecture through digital technologies enclosed hereto as Exhibit B.

C. ACTION ITEMS:

The respective action items of each party are outlined in Exhibit C ("Action Items").

D. THE PARTIES MUTUALLY AGREE THAT THE FOLLOWING TERMS AND CONDITIONS ALSO APPLY:

1. **COMMENCEMENT/EXPIRATION DATE.** This MOU begins on the Effective Date and expires on 3 YEARS FROM THE DATE OF SIGNING, unless terminated earlier in accordance with this MOU.
2. **PARTICIPATION IN SIMILAR ACTIVITIES.** This MOU in no way restricts AUTODESK or COLLABORATOR from participating in similar activities with other public or private agencies, organizations, or individuals.
3. **TERMINATION.** Either party, upon thirty (30) days' written notice, may terminate the MOU in whole, or in part, at any time before the date of expiration without liability to the other party. Further, either party may terminate this MOU, if the other party is in breach of this MOU and fails to cure such breach within ten (10) days after written notice of the breach.



4. PRINCIPAL CONTACTS. The principal contacts for this MOU are:

COLLABORATOR:

**THE VICE CHANCELLOR
VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELGAUM
Email : vc@vtu.ac.in**

AUTODESK:

**Anand Pillai
Education Lead – Autodesk India & SAARC
Autodesk India Pvt Ltd
Bangalore 560 025
Email: anand.pillai@autodesk.com**

5. FEES AND EXPENSES. Unless otherwise agreed by both parties, each party shall bear all of its own costs and expenses with regard to all negotiations, performance, and any other activities relating to the subject matter of this MOU.

6. CONFIDENTIALITY AND COMMUNICATIONS. Each party shall: (i) protect any information provided by the other party that is identified as confidential or that should reasonably be considered confidential ("Confidential Information"); (ii) use Confidential Information for the sole purpose of fulfilling its obligations under this MOU; and (iii) return all Confidential Information to the disclosing party promptly upon the expiration or termination of this MOU. Confidential Information may include, without limitation, computer programs, software or hardware products, product development plans, code, documentation, algorithms, know-how, trade secrets, formulas, processes, procedures, ideas, research, inventions (whether patentable or not), copyrights, schematics and other technical, business, financial and marketing information, forecasts, strategies, names and expertise of employees and consultants, customer or partner information, customer data. Except as otherwise provided herein, neither party shall use any trademark, service mark, logo or other proprietary right of the other party without that party's consent. COLLABORATOR may not publish or otherwise disseminate, in any form or format, any information arising out of or related to this MOU without AUTODESK's prior written review and approval. AUTODESK shall be entitled to publish or otherwise disseminate information, in any form or format through any media platform, about the Purpose using COLLABORATOR's name.

7. INTELLECTUAL PROPERTY. Except for the permitted use of Confidential Information, each party acknowledges that, under this MOU, a party acquires neither any intellectual or other property, including without limitation copyright, trademark, business or trade secrets, methodologies, professional techniques, works of authorship, training material, courseware or content ("IP") from the other party and nor any right in IP from the other party.



8. **APPLICABLE LAWS.** The parties shall be bound by all applicable laws. COLLABORATOR shall comply with (a) all applicable export laws and regulations, including without limitation the U.S. Export Administration Act and its implementing regulations ("the Export Control Laws"), and (b) the United States Foreign Corrupt Practices Act ("FCPA") or any rules or regulations thereunder, all other applicable anti-corruption laws, and AUTODESK's relevant corporate policies. COLLABORATOR shall notify AUTODESK immediately upon learning of any such failure to comply. This MOU shall be governed by the laws of the Republic of Singapore without regard to choice of laws principles.

9. **EXPORT CONTROL LAWS.** COLLABORATOR agrees and understands that under the Export Control Laws, the software, documentation, technical data (or direct products thereof) and services provided under this MOU may not be, directly or indirectly, downloaded or otherwise exported, re-exported, or transferred to restricted countries, to restricted end-users, or for restricted end uses. By way of example but not limitation, the Export Control Laws may restrict your ability to export or transfer the software to countries that are the subject of a U.S. trade embargo, to end-users who appear on U.S. government restricted party lists, and for restricted end uses such as research into chemical, biological or nuclear weapons. Additional information concerning U.S. export control laws and regulations is publicly available at: <http://www.bis.doc.gov/policiesandregulations/index.htm#ear>.

10. **ANTI-CORRUPTION LAWS:** In conformity with the FCPA or any rules or regulations thereunder, with all similar international laws, and with AUTODESK's relevant corporate policies, COLLABORATOR shall not take any action which would cause it to be in violation of such anti-corruption laws, including without limitation (i) the use of any funds for unlawful contributions, gifts, entertainment, or other expenses relating to political activity or (ii) making, attempting to make, offering or authorizing any unlawful payment, thing of value, bribe, rebate, payoff, influence payment, kickback or other similar unlawful payment to a foreign or domestic government official, for the purpose of influencing an act or decision (including a decision not to act) or inducing such a person to use his or her influence to affect any such governmental act or decision to obtain, retain, or direct any business.

11. **INDEPENDENT ACTORS.** Nothing in this MOU shall create or imply any agency, venture, partnership, representative, or employment relationship between the parties. This MOU shall not be constructed as authority for either party to act for the other party in any capacity, or to make commitments of any kind for the account of or on behalf of the other party.

12. **LIABILITIES.** Neither party is liable for the intentional or negligent acts or omissions of the other. Each party shall be responsible for its intentional or negligent acts or omissions and those of its officers, employees, agents, contractors, or students (if applicable), howsoever caused, to the extent allowed by applicable law.

13. **LIMITATIONS.** NEITHER PARTY MAKES A WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, OR FITNESS FOR A PARTICULAR PURPOSE. EXCEPT FOR BREACHES ARISING UNDER SECTIONS D.6-D.10, IN NO EVENT SHALL EITHER PARTY SHALL BE LIABLE HEREUNDER FOR ANY CONSEQUENTIAL,

10

11

12

13

14

15

16

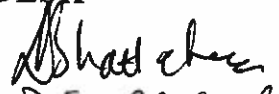
SPECIAL, PUNITIVE, INDIRECT, INCIDENTAL OR EXEMPLARY DAMAGES OR LOSS OF PROFITS, REVENUES, GOODWILL, OPPORTUNITIES OR COST OF REPLACEMENT GOODS OR SERVICES. IN NO EVENT SHALL EITHER PARTY BEAR ANY LIABILITY ARISING OUT OF OR IN CONNECTION WITH THE PERFORMANCE OR NON-PERFORMANCE OF THE ACTION ITEMS.

14. MODIFICATION. Modifications to this MOU shall be made by mutual consent of the parties through the issuance of a written modification, signed and dated by authorized representatives of each party, prior to any changes being performed.

15. SURVIVAL. The parties hereby agree that the provisions of Sections D.6-D.15 are binding and shall survive the termination or expiration of this MOU.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the later written date below.

AUTODESK

By: 
Name: D F & P ANKUR D HOZACHALYIA
Title:
Date: 31/11/2015

COLLABORATOR

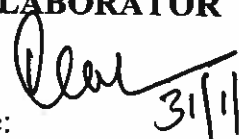
By: 
Name: 31/11/2015
Title: VICE CHANCELLOR
Viveksvaraya Technological University
BELAGAVI - 18



EXHIBIT A

PURPOSES

1. Create a sustainable partnership between COLLABORATOR and AUTODESK as Industry & Technology partner to enhance the quality of Technical and Design Education in the Institution.

2. Faculty Development

- a. Facilitate engineering and architecture faculty to use digital design pedagogy.
- b. Expose faculty members to latest industry concepts in mechanical and civil related disciplines.
- c. Prepare and benchmark faculty members through continuous training and Autodesk Global Certification programs. Introduce students to frontier digital design technologies thereby improve students' understanding and application of concepts.

AREAS OF ENGAGEMENT

1. Software Access to All Engineering Colleges affiliated to Visvesvaraya Technological University, Belgaum.

AUTODESK agrees to work with COLLABORATOR to provide free* access to Autodesk software to all the Government and Private Engineering Colleges affiliated to the COLLABORATOR and the same is valid as per the MOU terms and conditions to be entered into between AUTODESK and COLLABORATOR. COLLABORATOR agrees to promote awareness of the same to all member institutions and support the institutions in accessing the same through the standard download and activation process.

2. Setting up of Autodesk Design Lab for Training and Certification purposes at Visvesvaraya Technological University, Belgaum.

AUTODESK agrees to work with COLLABORATOR in setting up an exclusive Autodesk Design Lab by granting free* software – Autodesk Education Master Suite and Entertainment creation suite. COLLABORATOR agrees to setup a 100-seater lab with all necessary infrastructure including Computers with high end configuration to support installation of the software. Autodesk Global Certification will be offered to students in this center.

3. Curriculum Development Support

It is expressly agreed by and between AUTODESK and the COLLABORATOR that AUTODESK shall assist the COLLABORATOR in creating the curriculum content for the academic year 2015 to 2018. AUTODESK shall extend all co-operation to COLLABORATOR to formulate an extensive and suitable curriculum based on AUTODESK'S experience in the field of education gained vide working closely with the student community worldwide.



4. Train the Trainer program

AUTODESK agrees to work with COLLABORATOR to conduct faculty training programs for faculty members of the Institution and affiliated colleges in the State of Karnataka across 7 locations in the State. AUTODESK agrees to conduct trainings for identified master trainers from the Institution on the courses that will be launched and develop them into master trainers. The master trainers will then train students on the same.

5. Student Training Initiatives

AUTODESK agrees to work with COLLABORATOR's academy to launch courses on latest industry trends for students of Mechanical, Civil and related disciplines. The courses will be offered by identified Regional Training and certification centers in the state affiliated to VTU. Autodesk would train identified Master trainers and certify them. The courses are developed with the objective to prepare Students on latest industry Concepts and be globally competitive. It is agreed and understood by the COLLABORATOR that all financial obligations involving this activity shall be borne by the COLLABORATOR.

Courses will include but not limited to:

- a. Digital prototyping for Product Design for Mechanical and related disciplines.
- b. Building Information Modeling (BIM) for Civil, Architecture and related disciplines.
- c. Building Performance Analysis Certificate Course

6. Immersive Learning for Students

The courses are designed to encourage Applied learning where students are evaluated based on understanding concepts and applying product knowledge into application areas. Student project is a representation of technology use in learning and to gain practical knowledge in the domain. COLLABORATOR agrees to facilitate organizing Design Competitions to evaluate understanding and use of Digital tools by students.

**Free products are subject to the terms and conditions of the end-user license agreement that accompanies download of the software. Education versions of the software downloaded from Autodesk Academic Resource Center provided for the Institutions are intended for classroom or lab use.*

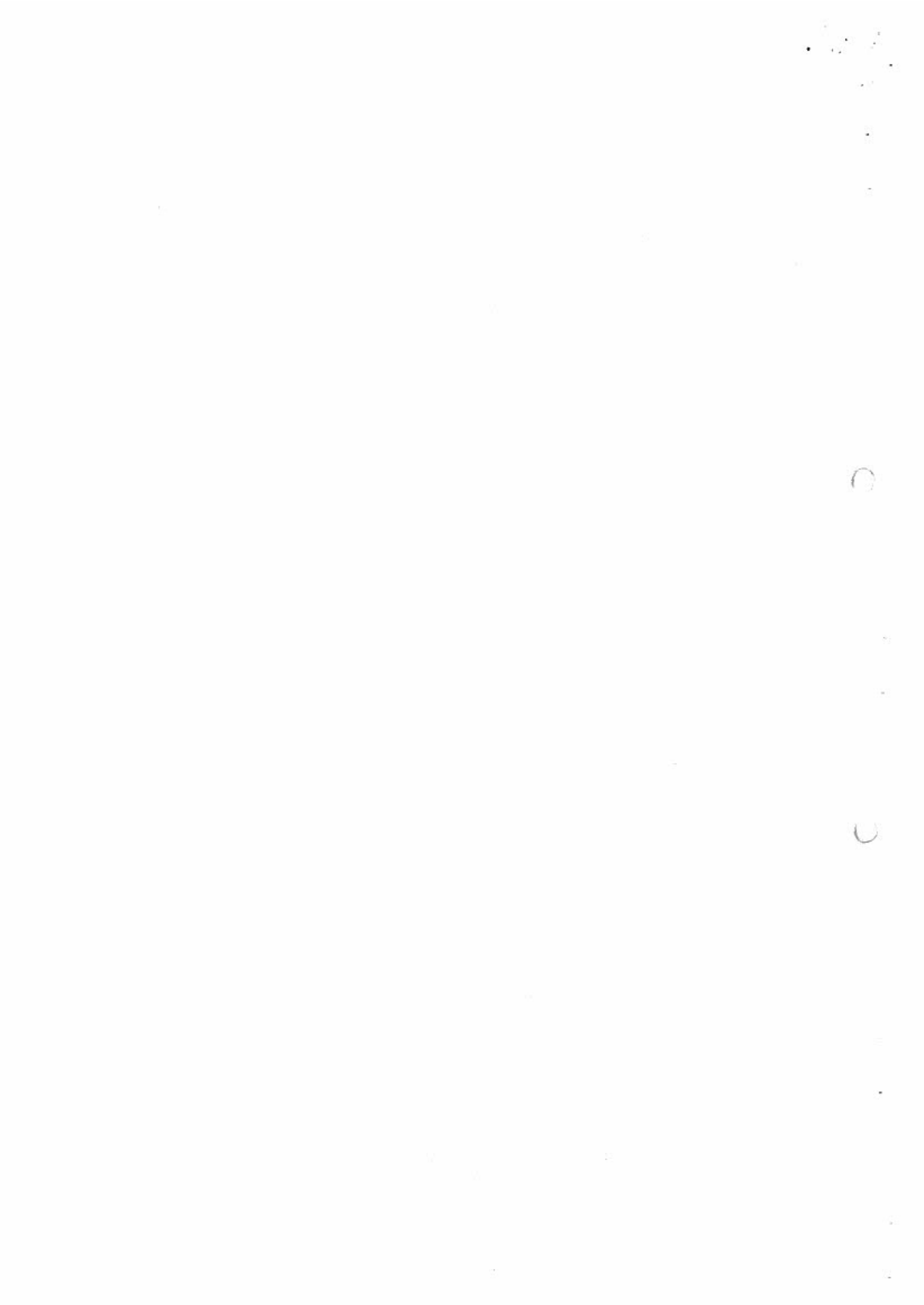


EXHIBIT B

PROPOSAL



EXHIBIT C ACTION ITEMS

1. AUTODESK

- a. AUTODESK agrees to provide Free* Software access to all the Government and Private Engineering Colleges affiliated to VTU in the State of Karnataka through the Autodesk Academic Resource Center.
- b. AUTODESK agrees to support the University in setting up an Autodesk Design lab by providing free* access to Autodesk Software.
- c. AUTODESK agrees to provide inputs to frame the content based on the market need.
- d. AUTODESK agrees to provide resources either directly or through its channel partners to train master trainers and thereafter supporting COLLABORATOR to conduct the courses successfully.
- e. AUTODESK agrees to provide courses, learning & training materials to the instructors.
- f. AUTODESK agrees to provide support in reviewing the student project.

2. COLLABORATOR

- a. COLLABORATOR agrees to setup an exclusive Autodesk Design Lab in the Institution to train students on latest courses on Mechanical, Civil and Entertainment disciplines.
- b. COLLABORATOR agrees to identify and nominate master trainers and prepare them to train students on the latest courses.
- c. COLLABORATOR agrees to evaluate the progress and review with AUTODESK at regular intervals.
- d. COLLABORATOR agrees to provide AUTODESK with a quarterly progress report.
- e. COLLABORATOR agrees to encourage the faculty members to use AUTODESK tools in their regular learning.

3. AUTODESK AND COLLABORATOR AGREE TO COOPERATE AS FOLLOWS:

- a. An official of COLLABORATOR to be nominated by mutual consent will coordinate the activities.
- b. Both the parties shall permit their respective experts to contribute in the teaching/training programs conducted by either organization through mutual consent.
- c. Both the parties shall obtain permission from the other prior to the use of respective name and logo in promotional literature and advertising material related.



**The Vice Chancellor
Visvesvaraya Technological University
India**

***Innovating Design Education for
Engineering and Architecture***

Anand Pillai

Program Manager – India, Middle East and Africa Region

Handphone: 91 9740018977 Email: anand.pillai@autodesk.com

Proposal to VTU, India

Contents

1.0	Introduction	4
1.1	Market challenges.....	4
1.2	Improving quality of education.....	6
2.0	Autodesk as a partner	7
2.1	About Autodesk	7
2.2	Autodesk Investment to Education.....	8
3.0	Goal & Objective	9
3.1	Goal.....	9
3.2	Objective	9
4.0	Areas of engagement.....	10
4.1	Digitalization of curriculum.....	10
4.1.1	Current situation	10
4.1.2	Curriculum development project & engagements.....	11
4.2	Digital design software	11
4.2.1	Current situation	11
4.2.2	Software to the institutions , students & faculty	11
4.3	Faculty development	12
4.3.1	Current situation	12
4.3.2	Train the Teacher (TTT) Program	13
4.4	Immersive learning	13
4.4.1	Student projects.....	14
4.4.2	Design competition	14
4.4.3	New courseware development.....	14
5.0	Measurement metrics	14
5.1	Technology Access	14

5.1.1	Education community registration & software downloads	15
5.2	Technology Adoption	15
5.2.1	Certification	15
5.2.2	Student outputs	15
5.2.3	Faculty outputs	15
6.0	Implementation	16
6.1	Phase 1: Year 1	16
6.2	Phase 2: Year 2	166
7.0	Next steps: Action items	167

Proposal to VTU, India

This proposal is submitted to express Autodesk interest in working with VTU, Karnataka in enhancing the quality of Technical education to meet up with global standards.

Upon discussion & acceptance, the partnership may be formalized through an MOU.

1.0 Introduction

1.1 Market challenges

Four major macroeconomic trends are making design more important to the world, and the world of business, than ever before. This means that designers, architects, engineers, and digital artists face unprecedented challenges.

The Digital Life: The first of the four trends affecting design professionals is the digital life. Keeping everything digital, and presenting it in that format, is becoming expected everywhere. Think about how young people today get information and entertain themselves; how they communicate; and how they express themselves—it's all digital. If we look at the leading video website, YouTube, the numbers are mind-boggling: 100 million videos are viewed every single day. But even more amazing is the fact that 65,000 new video clips are uploaded to the site every day. This is a radical democratization of the way we define what "culture" is. But "being digital" isn't just a lifestyle—it's also a work style. And the many digital devices we all use are changing the way we work and are making it possible to collaborate and compete with people all over the world.

When we engage with the next generation—whether to educate, train, entertain, or motivate them—the way we do it needs to be as fun as YouTube, as portable as a Game Boy, and as compelling as an Xbox. Less than that just won't be good enough. And it's not just the students. The whole world is going digital, and this digital lifestyle is changing the way we all work, play, and communicate.

This digital infrastructure and lifestyle is the foundation for the second trend: globalization and the increasing importance of emerging economies.

Globalization: The digital life has enabled rapid globalization; now everyone can collaborate and compete with everyone else, increasing commoditization and the need for great design as a competitive differentiator. Globalization

can mean many things - access to global talent, cheaper labor and materials, new business models, new markets, etc. So globalization, and the rise of emerging economies, can mean a lot of good things, but it also almost certainly means increased competition—for individuals, education, industries, professions, and even countries. And with increased low-cost competition, commoditization is a virtual certainty.

The most time-tested antidote to increased competition is making things better through innovation—and that's true whether we're talking about bicycles, cars, floor polishers, sneakers, buildings, cell phones, or software.

So, when you're trying to stand out from the global crowd, the goals are clear:

- Make things that look and work better
- Make things that are easier to use
- And, just as important, make things that make us feel better about ourselves

Innovation in those ways is more likely to succeed, no matter how digitized, or global, the world becomes. So, we're more global, more urban, and more interconnected than ever before. But ironically, our digital transformation has not had a corresponding analog one.

Infrastructure Management: Globalization has helped to create a global infrastructure boom; this includes developed nations repairing and rebuilding and emerging economies building, their infrastructures. It's estimated that about \$40 trillion will be required to build, rebuild, and repair the world's infrastructure. In emerging economies, this boom is fueled by the need to build out the infrastructure to support rapid industrialization and to meet the needs of increasingly urbanized and affluent populations. The growth of these countries requires airports, railways, and roads, as well as access to clean water and sanitation. The United States, Western Europe, and industrialized nations need to repair aging infrastructure and avoid the disasters and infrastructure damage due to natural disasters.

Over the next 20 years or so, we will build one-half of all the buildings that will exist in the year 2030. And we have to do all of this against the backdrop of an aging and shrinking workforce, and rising prices for commodities.

We need to use technology to not only build infrastructure, but also monitor and maintain it. For example, a series of "smart bridges" that are being tested

in New Mexico have fiber-optic sensors embedded deep within the bridges' concrete beams to monitor safety.

We need to work to invest in education and simultaneously tap into the global talent pool. We need to learn how to run large projects more efficiently and more effectively, and to make the entire design-engineer-operate lifecycle digital.

Climate Change and the Unstable Cost of Energy: Today we face serious environmental problems in terms of global climate change—changes to the quality of our air and water, and the availability of raw materials. We can address many of these challenges through a more sustainable approach to design. Creating more sustainable design will require not only innovative technological advances, but also changes in our behavior.

These challenges demand our best design and our best engineering. These need more than one generation to address these challenges. That calls for an enhanced investment in education to prepare the next generation with new ideas and approaches to address these challenges and take advantage of the opportunities they offer.

1.2 Improving quality of education

The ambition of economies becoming a knowledge super power has to be achieved by improving the quality of education through:

Information Empowerment: Many institutions and instructors mostly from the second tier towns and rural areas do not have the information to recognize the potential for technology in teaching and learning. Knowing how to use a computer is not enough. Instead, instructors must be knowledgeable about technology and self-confident enough to integrate it effectively into the curriculum. In other words, instructors must become "fearless in their integration of technology" and empowered by the many opportunities it offers.

Professional development: To create the largest base of the next generation of engineers, designers, architects and digital artists, VTU needs to create a base of skilled, industry-expert educators to ensure the desired knowledge transfer to students. There is an opportunity to provide value and integrate digital technology into faculties' professional development process by helping build

their expertise as industry authorities and illustrate the theoretical and practical application of technology.

Academic excellence: World class standard of the academic institution is the key factor in driving nations technical education to the globally acceptable standards. Technology enabled infrastructure, time relevant curriculum, syllabus and courseware are the vital infrastructure components to drive quality education. Digital design innovation labs should form an integral part of education. Curriculum should reflect technology advancements and bridge the demand – supply gap.

Knowledge delivery: Digital revolution has transformed the way knowledge is gathered and shared. Developments in information and communication technology have transformed the nature of knowledge delivery systems. Younger generations learn in a very different way than in the past. Students go beyond their teachers to learn. They have reduced dependency on face to face instructional methodology. They learn from peers over the digital network, they learn from sources beyond the geographical borders, they access knowledge at their pace and makes learning a fun experience.

2.0 Autodesk as a partner

2.1 About Autodesk

As a world leader in 2D and 3D design, engineering, and entertainment software, Autodesk delivers the broadest product portfolio, helping over 9 million customers, including every member of the Fortune 100, to continually innovate through the digital design, visualization, and simulation of real-world project performance. From architecture, manufacturing, transportation, and utilities to telecommunications, video games, television and film, Autodesk customers are leading the 2D and 3D design world by improving their design processes through increased efficiency and productivity. In fact, the last 14 Academy Award® winners for Best Visual Effects used Autodesk® software. By enhancing collaboration and communication and digitally improving the real-world performance of projects before they are built, Autodesk customers are solving their business challenges, avoiding costly rework, accelerating project cycles and time to market, and ultimately gaining competitive advantage.

The Autodesk portfolio of products offers a depth and breadth that is unparalleled, serving a wide range disciplines like Mechanical, Civil, Industrial

Design, Architecture & Animation. Autodesk portfolio of products is used in other disciplines of engineering as well.

Autodesk offers comprehensive suites designed around discipline-specific learning paths, while encouraging multidisciplinary learning. The extensive technology suites provide aspiring designers, architects, engineers and digital artists with access to industry tools used by professionals around the world.

2.2 Autodesk Investment to Education

Autodesk partners with government in emerging countries to modernize design and engineering education to meet the demands of the fast growing economy and prepare the students to compete with global standards.

Autodesk partners with secondary schools, post-secondary institutions, and education focused organizations around the world to support the advancement of design education with Autodesk technology and academic programs.

Since 2006, Autodesk has established 16 Centers of Excellence with leading design institutions in emerging countries such as India, China, and Russia. These COEs represent long term collaboration between Autodesk and institutions to better prepare the next generation of professionals.

The Student Engineering & Design Community continues to grow. Since launch in September 2006, it has grown to more than 1,000,000 members and over 1,500,000 downloads of software for free*, representing almost 25,490 schools in 147 countries. Through the online community site Autodesk provides students the opportunity to design with the products used by professionals around the world.

Autodesk is also continuing to expand upon its academic programs. In 2007, Autodesk offered students an opportunity to validate their knowledge and skills with a certification program, an offering extended to many countries.

**Free products are subject to the terms and conditions of the end-user license agreement that accompanies download of the software. The student and faculty version of the software is for personal use for education purposes and is not intended for classroom or lab use. Education version of the software provided for institution are meant for classroom and lab use only.*

3.0 Goal & Objective

“Engineers create wealth, other professions manage the wealth.” Engineering education is the pillar of economic development of a country. A lot has been spoken about need of enhancing the quality of Technical education. While a small percentage of engineers are successfully competing in the global scenario, many do not achieve anything worthy. It is not a mere coincidence that these successful engineers come from the elite institutions in the country. Quality faculty, progressive curricula, modern courseware and access to technology can be attributed as some of the reasons for this success.

Autodesk’s technology and comprehensive education program can assist the cross section of engineering and technical education institutions foster the next generation of architects, designers, engineers and digital artists.

3.1 Goal

The goal of this proposal is to drive statewide innovation in design education of engineering & architecture through digital technologies. This goal is achieved:

- **Through academia – Industry – Government partnership**
- **Through a faculty and student centric approach**
- **Through curriculum enhancement**

3.2 Objective

The overarching goal of this proposal will be accomplished through following set of objectives:

- **Create a sustainable partnership network of engineering & architecture institutions, VTU and Autodesk as Industry & technology partner**
- **Enhance learning content**
 - **Introduce digital courseware for classroom and lab learning to enhance concept learning specified by syllabus.**
 - **Enrich student evaluation to match digital courseware**
 - **Develop elective courses where appropriate**
- **Faculty development**
 - **Facilitate engineering and architecture faculty to use digital design pedagogy**

- Introduce skill development programs for academic support staff.
- Empower students
 - Introduce students to frontier digital design technologies thereby improve students' understanding and application of concepts.
 - Provide technology access to all sections of Nations education system. Empower all students and faculty alike including financially weaker section to own a personal copy of the software to enhance their learning.
 - Reduce or eliminate digital divide between the urban and rural education community.
 - Promote students' moral values to use legal software.

4.0 Areas of engagement

Autodesk has the experience, knowledge, resources and programs to address the need of engineering education system to compete in the globalized economy. Autodesk proposes to engage with department of higher education to address the requirements of the engineering and technical education system.

4.1 Digitalization of curriculum

Good curricula must emphasize on ensuring that technologies are used effectively to create new opportunities for learning and to promote student achievement and gainful employment. Curricula must be tied to student learning goals – they must provide activities in the context of industry practice. The best curriculum do not simply show how to add technology to what is currently being done, but instead, help faculty learn how to select appropriate digital content based on the needs and learning styles of their students and infuse it into the curricula rather than making it an end in itself.

4.1.1 Current situation

The world is fundamentally a different place than when most of the current curricula were developed. Technology has advanced at a pace which is unprecedented. Incidentally the curricula followed in many institutions are dated. Some institutes implemented new courses as electives or major to address the rapid changes in technology. This has led to a disjointed amalgamation of dated and modern subjects being

taught to students which has less or no relevance from employment stand point. Most of these curricula are reflective of a mandatory examination which the student has to attend by the end of the year or semester. More often than not these curricula do not develop the theoretical or practical knowledge the industry wants.

In another effort to modernize curriculum, software has been added as technology integration. In most cases the curricula concentrate on software usage rather than engineering concepts there by generating software operators from the higher education system.

4.1.2 Curriculum development project & engagements

Under the guidance and guidelines of VTU and related APEX bodies, Autodesk will work with premier institutes and eminent professors to develop discipline specific design curricula & courseware. These will elevate the usage design software beyond the conventional drafting to design in Mechanical, Civil, Architecture, Engineering, Construction, Mechatronic, Automobile, etc.

4.2 Digital design software

Access to the technology is of foremost importance. Availability of the latest technology in the institute is critical for preparing the next generation.

4.2.1 Current situation

Digital design software has revolutionized design pedagogy. Focus is shifted from drafting to design. Software has become a “tool” to learn concepts and solve design and engineering problems.

Design labs in many institutes are under resourced. Often these labs have older versions of the software due to the annual investment required to keep them updated. Another underinvested resource is the number of design software seats in the lab. On many of the instances number of Design software seat does not match the number of students in a batch.

Unlike drafting equipments students had as personal assets, it is expensive for many of the students to own a personal copy of the design software. This forces them to dependent on the software available at the school labs or they resort to illegal software copies. Many times, lack of lab availability or lack of access to the labs acts as a block in their learning process.

Learning new technology is mostly dependent on an instructor. This is mostly due to the limited learning material available. Most of the time software learning is through the built in help files.

4.2.2 *Free digital design software to institutes, students & faculty

Autodesk can provide design software to the labs of engineering colleges under VTU for learning Engineering, Architectural, Industrial Design and Animation courses. Autodesk through its "Education Community" portal can extend technology access by providing students and faculty with software and e- learning material for their personal self- paced learning.

**Free products are subject to the terms and conditions of the end-user license agreement that accompanies download of the software. The student and faculty version of the software is for personal use for education purposes and is not intended for classroom or lab use. Education version of the software provided for institution are meant for classroom and lab use only.*

4.3 Faculty development

Faculty development goes beyond the term "training" with its implications of learning skills and encompasses a definition that includes formal and informal means of helping instructors not only learn new skills but also develop new insights into pedagogy and their own practice and explore new or advanced understandings of content and resources. Faculty development includes support for instructors as they encounter the challenges that come with putting into practice their evolving understandings about the use of technology to support inquiry-based learning. Current technologies offer resources to meet these challenges and provide instructors with a cluster of support that helps them continue to grow in their professional skills, understandings, and interests.

4.3.1 Current situation

In a technologically advancing world, many of the teachers are unable to keep pace with the rapid change in technology. Professors as subject matter experts find it difficult to learn new software tools that complement the subject. Software vendors restrict their support to the mandatory training schedules which are mostly command based training rather than syllabus based. Faculty receives very limited support to meet the new generations' digital learning style. Faculty in rural areas is less

privileged for skill enhancement. They seldom get exposure or support on knowledge enrichment.

4.3.2 Train the Teacher (TTT) Program

Autodesk will work with VTU appointed agencies to conduct faculty development programs across 5 locations in the State. Through these trainings, we will develop master trainers in the identified anchor institutes who in turn can train students and faculty from adjacent institutions. Discipline specific, syllabus based training programs will be designed for continuous learning and faculty skill enhancement.

Autodesk Professional Excellence Program for Master Trainers.

Autodesk® Professional Excellence is a collection of programs offering software training, professional development, and accreditation to educators involved in games, broadcast television, film, and design visualization. The Autodesk Professional Excellence program can help faculty members keep updated on the latest technology and industry trends, connecting you with peers, and providing accreditation options that are recognized worldwide.

APEX Autodesk Professional Excellence

Recognition	Guidance	Learning	Sharing
Autodesk Certified Instructors (ACI)	Autodesk Certification Evaluators (ACE)	Train-The-Trainer (T3)	Professional Instructor Community (PIC)

- ACI program expose faculty members to Concept, Application and tool based teaching methodology by our experts.
- Autodesk Global Certification program will be offered to all Master Trainers. Master trainers are encouraged to attend the Autodesk Certified Instructor program held in India and Singapore to become an ACI.

4.4 Immersive learning

Faculty and students alike should be given opportunity to demonstrate their knowledge and benchmark with their peers. Competitive environment and avenues for recognition accelerates learning process. International competitions like Shell ECO Marathon, FSAE, etc are examples of competing with the best of the world on real world projects.

4.4.1 Student projects

Student project is a representation of technology use in learning. Design projects help students to gain practical knowledge in the domain. Digital design technology will help students in experiencing their design before it is real. Autodesk will support student projects using Autodesk technology.

4.4.2 Design competition

Autodesk will conduct & facilitate national and global design competitions that will give an opportunity to students to benchmark them with global peers.

4.4.3 New courseware development

Autodesk will promote faculty members to develop new courseware on engineering & design learning. "Autodesk Author" and "Autodesk Publisher" programs are designed to promote authors.

5.0 Measurement metrics

The success of technology and knowledge dissemination through the ICT framework is successful only when institutions start leveraging the offer and generate results. A quantitative measurement will provide the statistical data on technology access and adoption. These metrics can be used for evaluation and further improvement of the program.

5.1 Technology Access

Metric on technology access is to measure the rating and ranking of the offerings. This will give data on all the offerings accessed by the institution,

faculty and students. This data helps us to evaluate the delivery format, delivery mechanism, popular contents, etc.

5.1.1 Education community registration & software downloads

The first measure is the access to the technology. Through Autodesk Academic Resource Center(ARC) and Education community portal, VTU and Autodesk can generate periodic data on registration and software download from individual institutions. VTU will have visibility to the involvement of each institute on technology access.

5.2 Technology Adoption

Metric on technology adoption is to measure integration of digital design technology into the syllabus, curriculum and courseware.

5.2.1 Certification

Autodesk certification helps in measuring the quality of faculty & students. Autodesk will introduce online certification through certification centers for the faculty and students to test their knowledge and also for student to assist in their pursuit for design careers. No of certified students and faculty in an institute is the measure of knowledge acquisition.

5.2.2 Student outputs

Usage of digital design tools and technology in student projects including class projects, term projects and final year projects in institutes can be considered as metrics for technology adoption in learning.

Measure of designs submitted for design competitors is another metric of technology adoption

5.2.3 Faculty outputs

Number of digital design technology based courseware and textbook is a metric of technology adoption by teachers and also their effort to disseminate knowledge. Digitalization of these materials will help in knowledge sharing among the education community.

6.0 Implementation

Implementation of this program is proposed to be in two phases.

6.1 Phase 1: Year 1

In phase 1, students and faculty will have access to the technology and curriculum and faculty and staff will undergo training programs. VTU will also be able to monitor the progress of the project through the reports generated.

Following are the initiative for the phase 1 implementation

- Provide Software Access to Institutions, Students and Faculty Members
- Initiation of digitalized curriculum and courseware development projects
- Establish faculty development programs and budget.
- Establish metrics for technology access measurement

6.2 Phase 2: Year 2

In phase 2 during the second year, students will be ready for certification, projects and design competitions as they have been using the technology for that past one year.

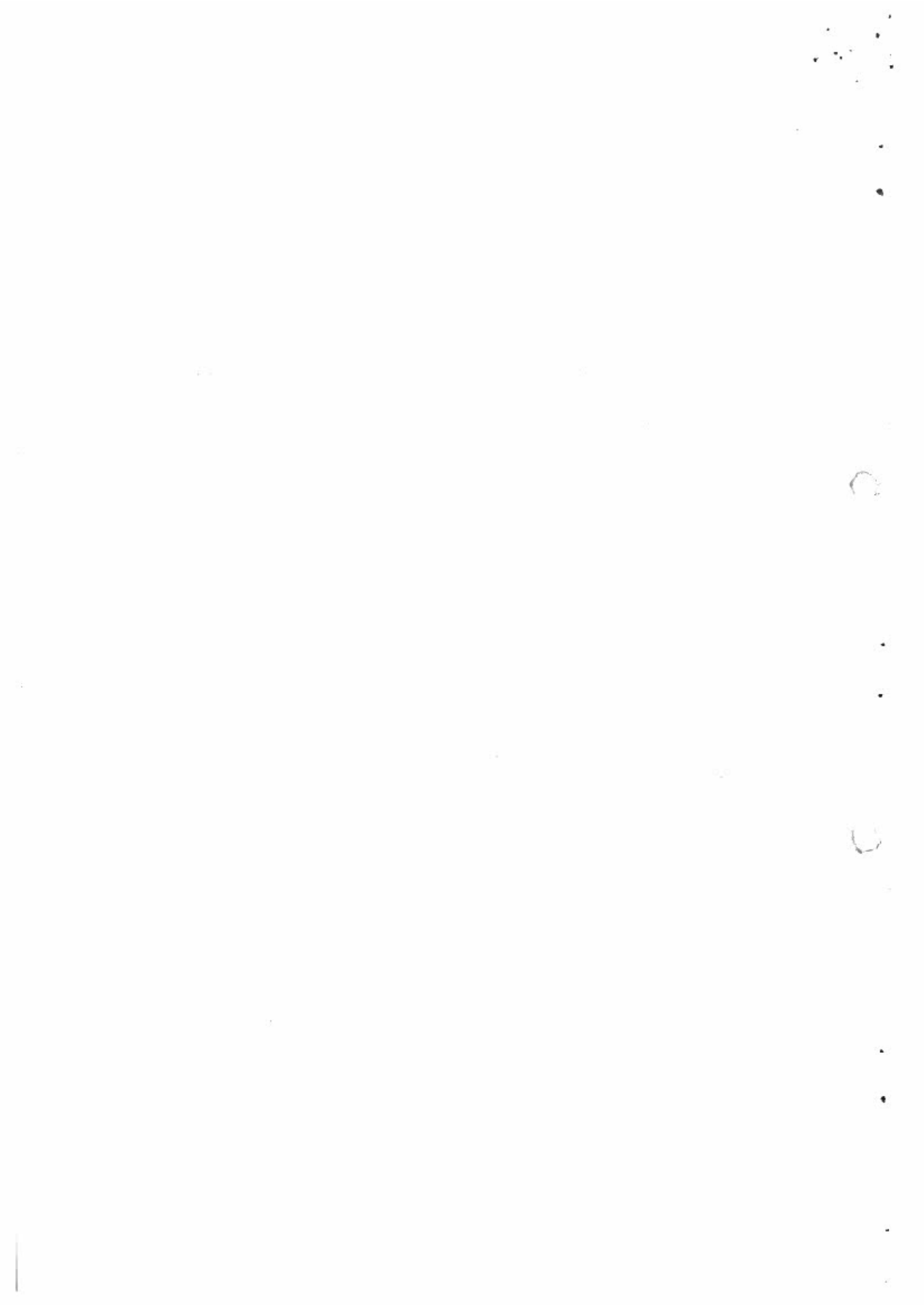
Following are the initiatives for Phase 2 implementation

- Support for student projects using Autodesk technology.
- Conduct design competition for students
- Develop authors from institutes to write on digital design.
- Implement Autodesk certification
- Establish metrics for technology adoption

7.0 Next steps: Action items

- Finalization of the proposal through a Memorandum of Understanding (MOU) between VTU and Autodesk for future engagements.
- Communication to Institutions on the Autodesk Academic Resource Center and software download process.
- Identify and appoint agencies to facilitate Faculty Skill Development Workshops. – (4.3)

- Budget allocation by VTU.
- Formation of a specific group comprising for members from VTU and Autodesk to formulate detailed implementation plan and ensure proper implementation.





Memorandum of Understanding (MoU)
between
India Electronics & Semiconductor Association (IESA)
and
Visvesvaraya Technological University (VTU)

This Memorandum of Understanding (MOU), effective upon the date of execution by the last party to sign is entered into by and between the **India Electronics and Semiconductor Association (IESA)**, principal place of business at Bangalore and the **Visvesvaraya Technological University (VTU)**, principal office at Belgavi.

About IESA

IESA is the premier trade body representing the Indian Electronic System Design and Manufacturing ESDM industry and has represented it since 2005. It has over 250 members -both domestic and multinational enterprises. IESA is committed towards building global awareness for the Indian ESDM industry and supporting its growth through focused initiatives in developing the ecosystem. This is through publishing credible data, networking events and alliances with other international associations. IESA works closely with the Government as a knowledge partner on the sector, both at the centre and at the state level. www.iesaonline.org

Talent Core Interest group formed by IESA is focused on development of talent for ESDM/VLSI industry.

About VTU

VTU is one of the biggest Technological University in India, having 201 colleges affiliated to it with under graduate course in 28 disciplines and PG Program in 71 disciplines

Purpose

This MOU focuses on the mutually beneficial collaboration between the two parties, thus ensuring exploration and harnessing of the stated initiatives. The objective of the MOU to collaborate with VTU to enhance its education value chain by providing industry oriented programs/courses so that VTU and Talent CIG together help the ESDM sector to get the industry ready talent from VTU and its constituent colleges/institutes. In the long run, we expect the VTU and its constituent colleges/institutes to become self-sufficient to run these courses/programs.



Taking India to ESDM Leadership

IESA Roles:

1. Provide reference curriculum for the subjects related to ESDM sector to VTU to include them in their curriculum in various programs at undergraduate and post-graduate levels.
2. Evaluate the suitability and readiness of the institute/college to roll out the programs/courses
3. Provide framework to foster outcome based education in an affordable manner.
4. Standardize the curriculum for courses/programs related to ESDM sector.
5. Enable VTU and its constituent colleges/institutes to become self-sufficient in rolling out these courses/programs in the long run Work with proven delivery partners, VTU and its members to create common standard for assessment and evaluation.
6. Enable colleges/institutes to establish connect with the industry for student placement in ESDM sector.
7. Update curriculum with industry inputs at regular intervals at least once in six months to ensure that the curriculum meets industry requirements in real time.
8. Identify the delivery partners to deliver the courses/programs to VTU colleges/institutes
9. Provide representatives from industry to validate the course curriculum and content and make representation at appropriate University forums
10. Deliver courses/programs in MOOC + physical classroom (Hybrid) model to maintain the program effectiveness
11. Validate the assessment in collaboration with delivery partners to ensure that evaluation methods assess the skills of the students that the ESDM sector needs
12. Establish industry interactions to increase the effectiveness of the courses/programs and keep them closure to industry requirements.
13. The above roles will be implemented by Talent CIG, a focused group in IESA created to make its vision and mission a reality to enable the industry to get industry ready talent.



VTU Roles:

1. VTU formally include the Talent CIG courses/programs and makes them integral parts of the programs at undergraduate and postgraduate levels
2. VTU will provide a single point of contact to resolve technical as well as administrative issues across institutes for conducting the courses.
3. VTU will direct institutes to provide access to the trainers conducting IESA courses.
4. VTU will direct the institutes to make available the designated learning enabler to upgrade skills in line with industry need on periodic basis including the cost through their FDP.
5. Create a path for its (VTU & its constituent colleges) faculty to become self-sufficient to deliver the courses/programs
6. VTU will direct the institutes to nominate a college faculty to work with IESA designated learning enabler.
7. Communication to its constituent colleges about the inclusion of the courses/programs
8. Enable the colleges to run the programs/courses smoothly in collaboration with Talent CIG
9. The colleges/institutes that will offer the courses/programs will bear the complete expenses of the courses/programs
10. Enable technology for industry interactions
11. Provide tool and other IT infrastructure to students so that the course can be run effectively because the courses/programs involve more than 65% practice sessions.

Jurisdiction

In case of any disputes, the jurisdiction will be Bangalore, India

Signatures

3/1/15
VICE CHANCELLOR

Visvesvaraya Technological University
BELAGAVI - 18

VTU

Name: Dr. H. Maheshappa

Title : Vice Chancellor

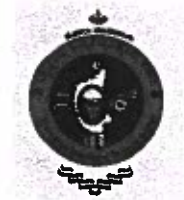
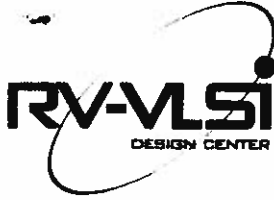
Date : 3rd February 2015

IESA

Name : Ashok Chandak

Title : Chairman

Date : 3rd February 2015



29
12

MEMORANDUM OF UNDERSTANDING

This Memorandum Of Understanding ("MOU") is dated 31.03.2015 ("Execution Date") and is entered into between:

RV VLSI Design Centre
(A unit of Rashtreeya Sikshana
Samithi Trust)
with its office at
26th Main, 36th Cross, 4th Floor,
Jayanagar 4th T Block,
Bangalore 560041 ... RV-VLSI

AND

The REGISTRAR (Academics)
Visvesvaraya Technological University
"Jnana Sangama" Belagavi : 590018
Karnataka, India. VTU

Introduction

The parties agree that the program offered under this MOU will help students enter the job market in India for engineering fields and faculty gain insights into the optimum use of EDA tools and technology to impart industry relevant instructions to its students after successfully completing the programs and or the activities described in this MoU. RV-VLSI expects to further its contributions to address the acute shortage of skilled manpower in the country

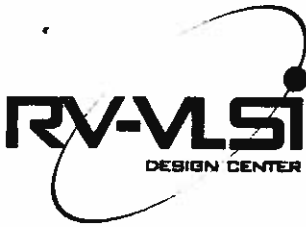
1. Definitions

- 1.1. 'Applicant' shall mean any individual or public or private entity/entities that are for-profit, not-for-profit, statutory bodies, NGO's, Government agencies, Universities, Educational Institutions, Accrediting Agencies or departments.
- 1.2. 'Program' shall mean the specialized skill development learning programs or activities offered jointly by the parties to this MOU, to the applicants concerned. Wherein, the said program shall consist of a combination of the industry standard courseware and

Initials:

Initials:

REGISTRAR
Visvesvaraya Technological University,
BELGAUM.



technology exposure, along with practical lab work that the Applicant shall undergo at designated centers. Refer to Annex 1 for details.

- 1.3. 'Customization' shall mean modifications to course content of the Program.
- 1.4. 'VLSI' means 'very large scale integration'.

2. Production and delivery of the Program

- 2.1. The parties' respective responsibilities regarding the programs are detailed in **ANNEX 1 and ANNEX 2** to this MOU, which are hereby incorporated by reference into this MOU.
- 2.2. Both parties agree that customization of the programs may be carried out based on the requests from industry only if the said customization does not dilute the broad applicability and value proposition of the existing program. In the event that the parties are unable to reach a consensus on the customization request, such customization shall not be offered.
- 2.3. Both parties agree to appoint CEO, RV-VLSI as the single point contact and interface to between VTU and the industry. This will facilitate the design, implementation and execution of any programs in the future in an efficient manner.

3. Pricing and revenue sharing: fees charged to applicants for the programs shall be subject to the following terms.

- 3.1. Applicants will be charged for participation in programs according to a fee structure described in Ann 1.
- 3.2. All fees charged for the programs shall be in the local currency where the course is offered. Fees for courses offered in India will be in Indian Rupees (INR).
- 3.3. Pricing and fees chargeable to the programs shall be subject to market demand and feedback, and is subject to revision annually by RV-VLSI.
- 3.4. The parties agree that the offer price may vary from region to region based on escalation of input costs and other economic conditions that require consideration in order to keep the terms of this MOU economically viable.
- 3.5. Service tax and any other applicable fees and taxes shall be paid by the applicant and shall be remitted to the appropriate authorities by RV-VLSI.

Initials: _____

[Handwritten Signature]

Initials: _____

[Handwritten Signature]

REGISTRAR
Visvesvaraya Technological University
BELGAUM



5.2. The parties agree to use reasonable efforts to expand the outreach of their jointly offered programs to southern and western regions and northern and eastern regions by the end of the third year after the Execution Date.

5.3. The parties agree that the above-indicated time frames may be varied based on discussions and negotiations between the parties in addition to market dynamics.

6. Marketing & Public Relations

6.1. The parties shall jointly frame guidelines for the sales and marketing campaign, which the parties agree to make reasonable efforts to adhere to in promoting the programs, and to jointly review the guidelines annually and make such revisions as they mutually deem desirable.

6.2. Both parties shall make reasonable efforts to utilize their respective existing marketing channels, including websites, official communication to colleges from the office of the Registrar, VTU to promote the programs according to the agreed guidelines, and to cooperate with and support one another's marketing efforts and outreach specially during the first few years.

6.3. VTU shall solely bear the costs incurred towards marketing activities.

6.4. Neither party shall contact any prospective applicants or publish any information about the subject of this MOU before such time as the parties mutually agree to announce the programs.

6.5. Both parties shall expeditiously act upon the requests made by the other party regarding marketing and publicity of the programs.

6.6. Both parties shall avoid causing damage to the brand image or reputation of the other party whilst marketing the programs and otherwise.

6.7. Both parties shall adhere to the logo usage guidelines promulgated by the parties separately. The said logo usage guidelines shall be made available to each other on specific request by the parties.

6.8. RV-VLSI is permitted to use the logo of VTU with the phrase "VTU Recognized Skill Development Center in VLSI and Embedded Systems" at its premises and in its sales and marketing presentations

Initials: 

Initials: 

REGISTRAR
Vishvesvaraya Technological Univer
BELGAUM



10. Non Solicitation

10.1 Neither party shall be permitted to solicit any students, clients or customers of the other party during the tenure of this MOU for any purpose that is identical to the program offered under this MOU.

11. No Hire

11.1 Neither party shall be permitted to hire any employees of either party during the tenure of this MOU.

11.2 Neither party shall solicit any employee of the other party during the term of that person's employment or for twelve months after the employment terminates.

11.3 Neither party shall be permitted to hire any employees of either party for one year after the termination of this MOU.

12. Closure/End of Association, Breach of Contract & Tenure

12.1. Tenure:

12.1.1. The tenure of this MOU shall be for five years and the tenure may be extended by the parties by mutual agreement.

12.1.2. The parties shall be free to modify the terms of this MOU and any annexes prior to extension of the tenure of this MOU by a written amendment, signed by both parties.

12.2. Convenience: It is clarified that neither party may terminate this MOU due to reasons of mere business convenience. Any termination by either party shall require the presentation of cogent reasons justifying termination of the MOU.

12.3. Withdrawal of Programs/Courses: The parties agree that a particular program may be withdrawn because of demand paucity or technological shortfalls.

12.4. Breach of Terms: This MOU shall be terminated automatically if either party commits material breach of the terms detailed in this MOU, but only if the non-breaching party promptly notifies the other party of the breach and the breaching party does not cure the breach within sixty (60) days. After the notice-and-cure period, the party responsible for such a breach shall be liable to pay the opposite party damages along with compensation towards losses incurred.

Initials: _____

Initials: _____

REGISTRAR
Visvesvaraya Technological University
BELGAUM



12.5. Unviability & Impossibility: This MOU shall be terminated if the parties to this MOU are unable to perform their obligations due to (a) changes in the market making the programs unviable; or (b) events or circumstances outside the reasonable control of the parties, including but not limited to acts of God, strikes, lock outs, accidents, war, fire, floods, industrial disputes, and other *force majeure* circumstances.

12.6. It is clarified that termination of this MOU shall not affect the non-compete, non-disclosure, confidentiality, non-solicitation, intellectual property and arbitration clauses detailed in this MOU.

12.7. Upon termination of this MOU under the circumstances detailed above, VTU shall be entitled to use the content relating to the program or modules after paying compensation to RV-VLSI. The compensation shall be decided upon mutually between the parties. However, if no consensus is reached between the parties, the matter may be referred to an independent valuator who may recommend an appropriate sum as fair compensation.

12.8. The independent valuer mentioned in the clause above shall necessarily possess experience in the field of valuating companies, projects and enterprises in the context of mergers and acquisitions.

12.9. The costs incurred towards the report of the independent valuer shall be borne equally between the parties.

12.10. In the event that any program is ongoing at the time of termination, the parties' obligations with regard to that program will remain in effect until the course is complete.

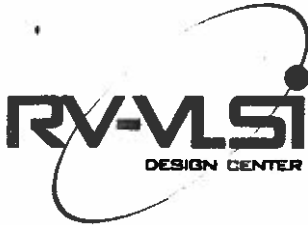
13. Representations, Warranties, and Indemnification

13.1. Each party represents and warrants to the other that: (a) it has the necessary power and authority to enter into this MOU; (b) the execution and performance of this MOU has been authorized by all necessary corporate or institutional action; (c) entry into and

Initials: _____

Initials: _____

REGISTRAR
Visvesvaraya Technological University
BELGAUM



14.4. If such notice is sent by registered post it shall be deemed served upon receipt of postal acknowledgment or delivery report from the Postal Department towards the same.

15. **Governing Law:** This contract shall be governed by and construed in accordance with Indian Law and the parties hereby agree to submit for all purposes in connection with this contract to the exclusive jurisdiction of Bangalore Courts. It is clarified that the jurisdiction of Indian Courts shall be subject to the Arbitration Clause of this MOU.

16. Arbitration

16.1. The parties hereto agree that any dispute or difference arising out of or in relation or connection to this Agreement shall be attempted to be settled amicably failing which it shall be referred to arbitration to be conducted as per the Arbitration & Conciliation Act 1996.

16.2. A sole arbitrator shall be jointly nominated by both parties. Such Sole Arbitrator shall necessarily be a retired judicial officer or a practicing attorney with sufficient experience in dispute resolution of at least five years.

16.3. **Seat of Arbitration:** All arbitration proceedings shall be held in Bangalore City.

16.4. All costs regarding arbitration shall be born equally between the parties.

Notice regarding arbitration:

16.5. All claims or disputes raised by VTU seeking adjudication by VTU shall be communicated to RV-VLSI in conformity with the Correspondence Clause of this MOU, upon receipt of which the parties shall jointly nominate a sole arbitrator or an arbitration institution within a period of three weeks from the date of receipt of notice.

16.6. Any claims or disputes raised by RV-VLSI seeking adjudication by a Sole Arbitrator or arbitration institution shall be communicated to VTU in conformity with the Correspondence clause of this contract. Upon delivery of the said notice the parties shall jointly nominate a sole arbitrator or an arbitration institution within a period of three weeks from the date of delivery.

Initials: _____

Initials: _____

REGISTRAR
Visvesvaraya Technological University
BELGAUM



1. Survival

17.1. Sections 4.3, 7, 8, 9, 11.2, 13.3, 15 and 16 shall survive termination of this MOU for the periods mentioned therein, failing which for a period of five years. Section 9 shall survive termination of this MOU for the periods mentioned therein, failing which for a period of one year.

Accepted

Mr. S. Venkatesh Prasad for RV-VLSI.

Title: CEO

Dated 31.03.2015

~~Bangalore.~~
Bilagavi

Accepted

REGISTRAR
Visvesvaraya Technological University
BELGAUM

Dr. K. E. Prakash for VTU.

Title: REGISTRAR (Academics)

Dated 31.03.2015

~~Bangalore.~~
Bilagavi

ANNEX 1

Roles and Responsibilities

Activity	VTU	RV-VLSI
Awareness and Promotion	VTU will advertise in leading national dailies the start of the course. Send circulars to all affiliated colleges for faculty participation. Advertise on the VTU home page in a prominent manner	RV-VLSI will create the layout and matter for the ads by working closely with VTU as per VTU guidelines Cost sharing on advertisements at 50:50 basis
Sale of Application	-NA-	RV-VLSI will design and sell the applications at RV-VLSI center for a nominal fee to cover the costs of test and assesment
Written Test and Interview	-NA-	RV-VLSI will design and administer the aptitude and technical test followed by interview at the center. A third part service may be used for this activity
Admission formalities	-NA-	RV-VLSI will collect the prescribed fees and issue necessary ID cards and create the student profile and registration kit. No Fee refund and other existing policies of RV-VLSI will continue
Course ware, workbooks, labs and teaching aids	-NA-	RV-VLSI will design, implement and execute the course
Teaching Faculty	-NA-	Faculty will be from RV-VLSI
Conduction of examinations and valuation	Provided by VTU as per university norms	The question paper will be designed and sent to VTU as soft copy. A list of evaluators will be sent to VTU for consideration Invigilation will be done by RV-VLSI staff.
Award of Certificates	Final mark sheets and certificates will bear the name and seal of VTU duly signed by its authorized representative. All certificates will be designed, printed and delivered to RV-VLSI by VTU as per VTU procedures	RV-VLSI will affix a hologram on the certificate to maintain its identity. The certificates will be delivered to RV-VLSI by VTU and the same will be issued to the candidates after ensuring all formalities have be complied with by the candidate
Boarding and Lodging for outstation students	-NA-	-NA-

Initials: _____

Initials: 
REGISTRAR
Visvesvaraya Technological University
BELGAUM



Highlights of the Certificate in VLSI Design - CVLSI.

The Certificate in VLSI Design of four months duration consists of two phases. In phase one the regular curriculum for a 8 week duration is covered followed by examinations. In Phase two of the course consists of working on a live project for 4 weeks followed by evaluation and Viva-voce.

Phase one of the program offers VLSI training as relevant to ASIC Design, enabling students to gain mastery and technical expertise in this specialized area of VLSI Design. The course builds from core concepts to advanced levels with a right balance of lectures and labs, followed by a live project in phase two. Conducted by a team of highly dedicated industry professionals, the program is delivered in an industry like atmosphere.

During phase one of the course engineers have to study all the subjects pertaining to this phase. For each subject students have to attend lectures and labs where they work on design problems assigned to them by the concern faculty using EDA software tools. An integral part of the learning plan is seminars, presentations and attending meetings which simulate an industry atmosphere, these meetings are aimed at drawing out the best solution to the design problem. Students will have to carry out preliminary studies and do online research under the guidance of the concern faculty. After the completion of all modules in phase one students have to appear for exams conducted by the university.

Immediately after the exams phase two of the course begins where the students will be assigned to different teams based on the design task entrusted to them. They will be required to interact with other members in the team, conduct research and present their solution in a effective manner during design reviews. The designs are brought to the level of tapeout.

The course content and duration is subject to change to suite the changing requirements of the industry. This certificate may be offered to engineering graduates in lieu of BE/ME/BTECH/MTECH Projects towards partial completion of their degree requirements. The course maybe offered as a fulltime and/or part-time course.

Applicability: The course is considered towards partial fulfillment of requirements leading to a degree offered by VTU which include BE/ME projects, mini-projects, seminars and internships.

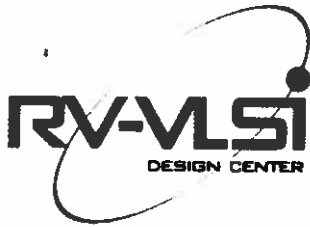
Location: The courses will be currently offered at RV-VLSI Design Center campus in Jayanagar 4th T BLK Bangalore campus. The course will be taken to other regions of the state in a phased manner

Phd Research: As a significant portion of the time in the course is spent towards use of technology and tool exposure this will be ideal for Phd research scholars to undergo which will help in Phd research. RV-VLSI and its technology partner will assist Phd candidates in the capacity of guides and co-guides to help the research scholars complete their thesis.

Initials: HL

Initials: Kesava

REGISTRAR
Visvesvaraya Technological University
BELGAUM



Course Duration: The course duration and course content is subject to change without prior notice to suite the
The current job market and needs of the ESDM industry in India.

Fees and Refunds: The fees is subject to change based on escalations to input costs and appropriate share of VTU will be remitted as agreed in this MoU. No refund in fees after commencement of course. Prior to commencement of course a registration and process fee will be deducted and the balance will be returned to the applicant by way of A/C payee check.

Course calendar: The courses will be offered in two modes fulltime and part-time. This is being offered for the benefit of those engineering students who wish to take this to meet the requirements needed to secure a degree. A detailed course calendar will be published on the website of RV-VLSI and VTU at an appropriate time.

Target Audience

Engineers working in IT/BPO industry looking for change of track.

Aspiring VLSI engineers fresh out of college having completed a UG/PG in relevant discipline or engineering graduates

Engineers sponsored by semiconductor companies

Faculty from engineering college seeking skill up-gradation. Phd applicants and research scholars

Eligibility Criteria

Candidates who have scored a minimum of 65% marks in aggregate in the qualifying examination of BE/B. Tech.in circuit branches or equivalent degree from a recognized and PUC and SSLC Degree in Electronics and Communication, Telecommunication, Electrical Engineering, IT, Computer Science, Instrumentation, or equivalent degree from recognized universities/institutes are eligible for admission to the course.

ME/MTech students in VLSI and Embedded or related stream are also eligible to apply.

This criteria does not apply to candidates sponsored by companies or to applicants who are students pursuing their engineering education.

Selection Procedure

Written Test & Aptitude Test

1. All candidates have to take a written Technical Test of one hour duration, along with an Aptitude Test of 1 hour duration.
2. Candidates passing the aptitude and written test will be interviewed one-on-one and result of admission communicated to them on a specified date.
3. The written and aptitude test is waived for employees of VLSI companies who are sponsored by their employer
4. For out station candidates RV-VLSI authorized testing centers will be designated in sixteen cities nationwide for candidates to appear for the tests. For such candidates the one on one interview will be via

Initials:

Initials:

REGISTRAR
Visvesvaraya Technological University
BELGAUM

video conferencing and/or a phone interview. For such candidates a provisional admission is granted. The CEO of the center will be the final authority to decide whether to grant admission or not for out station candidates on a case by case basis.

5. This does not apply to engineers who are pursuing their BE/ME and are taking this certificate program as a partial fulfillment of meeting the degree requirements.
6. RV-VLSI reserves the right to grant admission the decision of the management is final in this regard.

Scheme and Duration of the Course: Certificate in VLSI Design (CVLSI)

I. Basic Curriculum + Project work + Examination = 24 weeks

SI No	Subject Code	Subjects	Total Number Of Hours		No of weeks
			Lecture Hours	Practical & Assignments	
1	ADVD1	Fundamentals of System Design	20	20	1
2	ADVD2	Fundamentals of SoC Design	20	20	1
3	ADVD3	IC Fabrication and DFM	20	20	1
4	ADVD4	FPGA Implementation and ASIC Design	30	30	1.5
5	ADVD5	Fundamentals of ASIC Verification	50	30	2
6	ADVD6	Physical Design and chip Integration	30	30	1.5
7	SEM1	Seminar and Project Prep.	40		1
8		Project Work		288	12
9		Exams, Practicals and project viva, mock interviews			3

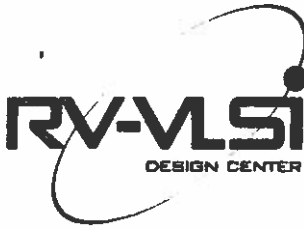
SCHEME OF EXAMINATION

Certificate in VLSI Design (CVLSI)

SCHEME OF EXAMINATION CURRICULUM							
SI No	Subject Code	Subject	Duration of Exam - Hrs		Marks		
			Theory	Lab	Theory	Labs	Total
1	ADVD1	Fundamentals of System Design	90min	180min	50	100	150
2	ADVD2	Fundamentals of SoC Design	60	180	50	100	150
3	ADVD3	IC Fabrication and DFM	60	180	50	100	150
4	ADVD4	FPGA implementation and ASIC Design	60	180	50	100	150
5	ADVD5	Fundamentals of ASIC Verification	60	180	50	100	150
6	ADVD6	Physical Design and chip Integration	60	180	50	100	150
7		Project				300	300
Grand Total of Marks					300	900	1200

Initials:

Initials:
REGISTRAR
Visvesvaraya Technological University
BELGAUM



Grading Scheme

The final mark sheet will have Grades as follows:

- A+ 100% to 90%**
- A 89% to 80%**
- B 79% to 60%**
- C 60% to 40%**
- D 40% and below**

Certification:

Min 75% attendance in both theory and project for grant of Certificate and transcript

If the attendance is less the Certificate is not granted only a transcript is provided

Candidate must readmit by paying a fee a makeup fee and makeup for low attendance subject to availability of seats

Refunds;

No refund of any fees once the course has commenced. If a refund is requested for a valid reason in writing a fee of Rs. 7750/- plus any taxes collected will be withheld and the balance will be returned by check. However a fee credit voucher can be requested to take up a course within a two year period. Fee is not transferable.

The candidate must provide a written declaration to this effect

Boarding and loading for Out station students

See table for details

Highlights of the Certificate in Embedded System Design – CESD

The course on Certificate in Embedded System Design is of 14 weeks duration consists of two phases. In Phase 1 and phase two of the regular curriculum is covered for a 8 week duration followed by a live project of 3 weeks followed by exams.

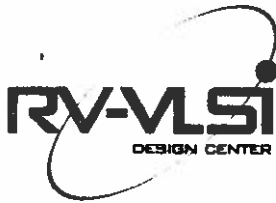
Phase one of the program offers training as relevant to Embedded Domain enabling students to gain mastery and Technical Expertise in the areas of Advanced 'C' and Advanced Microcontrollers. In Phase Two of the Program offers training relevant to Linux System Programming, Device Driver Development, Embedded Linux with Python Programming as Application Domain. The course builds from Core concepts to advanced levels with a right balance of Lectures and Labs. Conducted by a team of highly dedicated industry professionals, the program is delivered in industry like atmosphere.

During this course Engineers have to study all the subjects pertaining to both the phases. For each subject, students have to attend lectures & labs where they work on design problems assigned to them by the concern faculty. An integral part of the learning plan is seminars, Presentations and attending meetings which simulate an industry atmosphere, these meetings are aimed at drawing the best solution to the design problem. Students will have to carry out preliminary studies and do online research under the guidance of concern faculty. After the completion of all the modules students have to appear for exams conducted by university. The course content and duration is subject to change to suite the changing requirements of the industry. This certificate may be offered to engineering graduates in lieu of BE/ME/BTECH/MTECH Projects towards partial completion of their degree requirements. The course maybe offered as a fulltime or part-time course based on popularity and demand.

Initials: _____

Initials: _____

REGISTRY OF
Visvesvaraya Technological Institute
BELGAUM

**Reference Books for the course**

The list of books prescribed by VTU for MTech in VLSI & Embedded Systems is used for ADED

Applicability: The course is considered towards partial fulfillment of requirements leading to a degree offered by VTU which include BE/ME projects, mini-projects, seminars and internships.

Location: The courses will be currently offered at RV-VLSI Design Center campus in Jayanagar 4th T BLK Bangalore campus. The course will be taken to other regions of the state in a phased manner

Phd Research: As a significant portion of the time in the course is spent towards use of technology and tool exposure this will be ideal for Phd research scholars to undergo which will help in Phd research. RV-VLSI and its technology partner will assist Phd candidates in the capacity of guides and co-guides to help the research scholars complete their thesis.

Course Duration: The course duration and course content is subject to change without prior notice to suite the The current job market and needs of the ESDM industry in India.

Fees and Refunds: The fees is subject to change based on escalations to input costs and appropriate share of VTU will be remitted as agreed in this MOU. No refund in fees after commencement of course. Prior to commencement of course a registration and process fee will be deducted and the balance will be returned to the applicant by way of A/C payee check.

Course calendar: The courses will be offered in two modes fulltime and part-time. This is being offered for the benefit of those engineering students who wish to take this to meet the requirements needed to secure a degree. A detailed course calendar will be published on the website of RV-VLSI and VTU at an appropriate time.

Target Audience

Engineers working in IT/BPO industry looking for change of track
Aspiring Embedded Engineers fresh out of college having completed a UG/PG in relevant discipline
Engineers sponsored by Embedded companies
Faculty from Engineering college seeking skill up-gradation

Eligibility Criteria

Candidates who have scored a minimum of 65% marks in aggregate in the qualifying examination of BE / B Tech in circuit branches or equivalent degree from a recognized and PUC & SSLC. Degree in Electronics and Communication, Telecommunication, Electrical Engineering, IT, Computer Science, Instrumentation, or equivalent degree from recognized universities / Institutes are eligible for admission to the Course
ME / M Tech students in VLSI and Embedded or related stream are also eligible to apply.
This criteria does not apply to candidates sponsored by companies or educational Institutions towards partial fulfillment of degree requirements

Initials: _____

HL

Initials: _____

Ke...

REGISTRAR
Vishvesvaraya Technological
BELGAUM

Selection Procedure

Written Test & Aptitude Test

1. All candidates have to take a written Technical Test of one hour duration, along with an Aptitude Test of 1 hour duration.
2. Candidates passing the aptitude and written test will be interviewed one-on-one and result of admission communicated to them
3. The written and aptitude test is waived for employees of VLSI companies who are sponsored by their employer.
4. For out station candidates RV-VLSI authorized testing centers will be designated in sixteen cities nationwide for candidates to appear for tests. For such candidates the one on one interview will be via video conferencing and/or a phone interview. For such candidates a provisional admission is granted. The CEO of the center will be the final authority to decide whether to grant admission or not for out station candidates on a case by case basis.
5. This does not apply to engineers who are pursuing their BE/ME and are taking this certificate program as a partial fulfillment of meeting the degree requirements

Scheme & Duration of the course: Certificate in Embedded System Design (CESD)

Basic Curriculum + Project Work + Examination = 14 weeks

SI No	Subject Code	Core subjects	Total No of hours		No of weeks
			Theory	Practical	
1	ADED1	Advanced C concepts	40	40	2
2	ADED2	ARM 32 bit Micro controller programming	20	20	1
3	ADED3	Linux System programming	40	40	2
4	ADED4	Linux Device driver Development	20	20	1
5	ADED5	Embedded Linux	20	20	1
6	ADED6	Python (Programming Language)	20	20	1
	ADED7	Project work		120	3
		Exam, Practicals and project viva, mock interview			3

SCHEME OF EXAMINATION

Certificate in Embedded System Design (CESD)

SCHEME OF EXAMINATION CURRICULUM							
SI No	Subject Code	Subject	Duration of Exam - Hrs		Marks		
			Theory	Lab	Theory	Labs	Total
1	ADED1	Advanced C concepts	60min	180min	50	100	150
2	ADED2	ARM 32 bit Micro controller programming	60	180	50	100	150
3	ADED3	Linux System programming	60	180	50	100	150
4	ADED4	Linux Device driver Development	60	180	50	100	150
5	ADED5	Embedded Linux	60	180	50	100	150
6	ADED6	Python (Programming Language)	60	180	50	100	150
7		Project Work				300	300
Grand Total of Marks					300	900	1200

Initials:

Initials:



Grading Scheme

The final mark sheet will have Grades as follows:

- A+ 100% to 90%
- A 89% to 80%
- B 79% to 60%
- C 60% to 40%
- D 40% and below

Certification:

Min 75% attendance in both theory and project for grant of Certificate and transcript

If the attendance is less the Certificate is not granted only a transcript is provided

Candidate must readmit by paying a fee a makeup fee and makeup for low attendance subject to availability of seats

Refunds;

No refund of any fees once the course has commenced. If a refund is requested for a valid reason in writing a fee of Rs. 7750/- plus any taxes collected will be withheld and the balance will be returned by check. However a fee credit voucher can be requested to take up a course within a two year period. Fee is not transferable.

The candidate must provide a written declaration to this effect

Boarding and loading for Out station students

See table for details

Calendar of Training Programs or Activities covered in the MOU

Courses are conducted as per the following calendar:

Sl No	Course/Activity	Code	Batch size	Number Of Batches per Year	From - To	Duration In month	Fees (Rs.)
1.	Certificate in VLSI Design	CVLSI	50	3 + 2	Jan to April May to August Sep to Dec	6	INR 1,22,475/- before taxes, if applicable
2.	Certificate in Embedded System Design	CESD	50	3 + 2	Jan to April May to August Sep to Dec	3.5	INR 54,000/- before taxes, if applicable

Accepted

Mr. S. Venkatesh Prasad for RV-VLSI.

Title: CEO

Dated 31.03.2015

~~Bangalore.~~

Belagavi
for

Accepted

REGISTRAR

Visvesvaraya Technological
BELGAUM

Dr. K. E. Prakash for VTU.

Title: REGISTRAR (Academics)

Dated 31.3.2015

~~Bangalore.~~

Belagavi



ANNEX 2

RV-VLSI and its agents or partners will work with VTU to design, develop, implement and maintain the infrastructure of the labs at its Regional Centers in Bangalore, Mysore, Hubli and Belgaum in a phased manner to offer the programs described in Annex 1 in a phased manner.

1. The commercials for this activity will be provided at the time this activity is taken up.
2. By mentioning here by way of a reference to the MoU implies that VTU intends to use this service shortly.
3. The project will be executed after mutual discussion and agreement on the commercials.

Accepted

Mr. S. Venkatesh Prasad for RV-VLSI.

Title: CEO

Dated 31.03.2015

~~Bangalore.~~

Belgaum

Accepted

REGISTRAR
Visvesvaraya Technological University,
BELGAUM

Dr. K. E. Prakash for VTU.

Title: REGISTRAR (Academics)

Dated 31.3.15

~~Bangalore.~~

Belgaum

K.S. Bharathi Kumar, B.A., LL.B.(Hons.)
ADVOCATE

101, 1st Floor, Kurubara Sangha Building,
1st Main, Gandhinagar, BANGALORE - 560 009.
Ph. : 2234 0283, Telefax : 2234 0283
Mob. : 98453 79509
E-mail : bkcoorg@gmail.com

Date: 02.02.2015

To,
The Registrar,
Visvesvaraya Technological University,
Belgaum.

Sir,

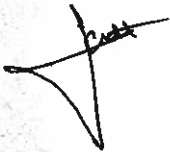
SUB: MOU – RV-VLSI-Legal Opinion

REF:- VTU/2014-15/11065, Dated 31.01.2015

I have examined the above referred MOU. The interest of the University has been fully protected in the clauses pertaining to the legal aspects incorporated in the MOU. However, the clauses pertaining to the factual aspects incorporated in the MOU may be verified by the concerned subject expert.

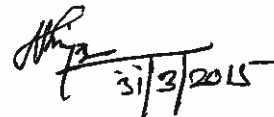
I am herewith forwarding my bill towards the professional charges for having scrutinized the above referred MOU.

Yours faithfully,



Dean
H.O.

MoU may be executed.



31/3/2015



Memorandum of Understanding
On Integrated Waste Management M.Tech Course
Between
GGI Energy Pte. Limited - Singapore
and
Visvesvaraya Technological University,
Balagavi, - India



Memorandum of Understanding (MOU)

Between:

GGI Energy Pte Ltd

Company Registration no: 201106544M

8 Marina Boulevard #5-02,
Marina Bay Financial Tower 1,
Singapore 018981

(Hereinafter called "GGI")

Represented by Ravi Ram Mohan, Head of India Operations

A limited private company established in Singapore that specializes in research, development and processing of municipal solid waste, whose technology has been designed to process all waste streams without the need for sorting the waste into organics, green, food and other putrescible wastes, in a green, clean, safe and secure manner. GGI designs and processes Waste into Energy and has collaboration with Monash University Australia.

AND

Visvesvaraya Technological University

Belagavi, Karnataka 590018, India

(Hereinafter called "VTU")

Represented by the Registrar of VTU

An Educational Institution established in 1998 as per VTU University Act 1994 and offers higher education in Technology relevant to current and future needs of the society

PURPOSE:

This MOU entered between both parties on 17th July 2015, has a reference to the proposal (GGI/VTU/EOI Dt. 11th May 2015) given by GGI to set up Waste to Energy Plant and be a part of VTU's plan to set up Master's / Post Graduate program in Waste Management. This program offered under the MOU shall help students, institutions and society to address a much needed national vision of CLEAN & GREEN INDIA ("Swatch Bharath")& NATIONAL SKILL DEVELOPMENT PROGRAM.

The Scope of MOU shall be:

A. For the proposed Waste Management course:

1. Conduct seminars and symposiums jointly to educate and bring industry best practices to local communities in India.
2. Undertake research and consultative studies in local & international communities on handling waste related issues.



3. VTU Students can visit other GGI facilities as part of industry & project visits.
4. GGI can send people to be trained from companies and countries where GGI's technology is being set up to VTU to gain and share knowledge in this area.
5. Enhance & introduce other certification courses/programs other than Master's/Post Graduate program
6. GGI representative shall be invited as Special Invitee to advice the industry best practices and to strengthen the curriculum of M.Tech. Waste Management Programme as and when required by VTU.
7. Anything else jointly both parties may wish to add to our collaboration as part of our engagement from time to time.

B. Intellectual property & Confidentiality:

This knowledge gained and shared shall remain as exclusive property of the disclosing party and where joint efforts have resulted in knowledge gain as part of this MOU scope; such intellectual property shall remain with of both parties.

C: Communication:

All normal communications shall be by email and to the registered address mentioned in the MOU.

D: Revenue Share:

All revenues earned though this relationship shall be split in the following ratio:

Title	Ratio of revenue share to VTU	Ratio of revenue share to GGI
Waste management course fees	70%	30%
Seminar & Conferences	30%	70%
Consulting engagements with 3 rd parties	50%	50%
Any other area*	Mutually discuss & agree	Mutually discuss & agree

*Such revenues shall be remitted through a separate agreed payment structure that shall be due and payable upon receipt of such funds based on case-to-case basis agreed mutually.

E. Tenure & Termination:

This shall be valid for a period of fifteen years (15 years) and renewable automatically for a similar tenure thereafter unless terminated with mutual agreement after the first tenure is over by giving six months notice of such decision to terminate.



F. General

Anything inconsistent or hereafter not specifically mentioned in this MOU, the VTU ACT and regulations and or the University Grants Commission (hereinafter called UGC) ACT and or any Govt of India agreement between Singapore and India as part of inter country treaty which is for the time being in force shall apply to this MOU and is binding on both parties.

Anything that is not explicitly agreed in this MOU is not to be assumed as agreed or given by any party and shall mutually discuss to agree to such new additions and incorporate such agreed clauses as annexure to this MOU.

GGI India is under process of Registration. Once completed the same shall be intimated to VTU.

G: Arbitration

Should any disagreement arise during the tenure of the said MOU, the same shall be attempted to be resolved by the Chairman of GGI & Vice Chancellor of VTU. Should this not be resolved even after continued attempts, both parties can decide to refer this to a mutually acceptable arbitrator in a location and country acceptable to both parties for resolution.

H: Governing Law

Bi-lateral treaty laws of Singapore and India and in addition where necessary international resolution as per United Nations Charter shall be followed that shall govern this MOU.

Both parties hereto agree to collaborate and provide the necessary resources to fulfill the obligations set forth in this MOU.

For
Visvesvaraya Technological University
Belagavi, Karnataka 590018, India

For
Global (GGI)
8 Marina Boulevard #5-02,
Marina Bay Financial Tower 1,
Singapore 018981

Registrar
REGISTRAR

Visvesvaraya Technological University,
BELGAUM

witness:

A. PRAKASH YALAHALI

Head - India Operations

witness:

Mes
(M. V. Rayappa)
SO, VTU



25/14



Sapience Consulting

Memorandum of Understanding
Between
Sapience Consulting, a Texas Instruments University Program Partner, India
And
Visvesvaraya Technological University

This memorandum of understanding (MOU) which is signed on the 20th July, 2015 and expires on 19th July, 2017

IS BETWEEN

Sapience Consulting, having its registered office No: 4, 4th Floor, 6th Block, 6th Cross, Koramangala Club Road, Koramangala, Bangalore-560095, India (hereinafter referred to as "COMPANY", which expression shall, unless it is repugnant to the context or meaning thereof be deemed to include its successors and assigns) of the FIRST PARTY.

AND

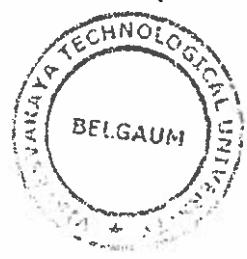
Visvesvaraya Technological University (VTU) having 205 engineering colleges, established in 1998 by the Government of Karnataka to enhance the technical education in the state, having its registered office at "Jnana Sangama" Belagavi-590018, Karnataka, India hereinafter referred to as "UNIVERSITY", which expression shall, unless it is repugnant to the context thereof be deemed to include its successors and assignees represented by its Registrar of the SECOND PARTY.

(COMPANY and UNIVERSITY shall hereinafter be individually referred to as "Party" and collectively referred to as the "Parties")

WHEREAS

UNIVERSITY Kopang

SAPIENCE CONSULTING Abuwa





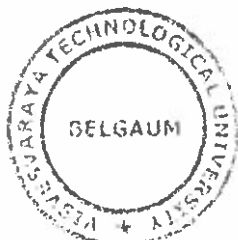
Sapience
Consulting

Texas Instruments India University Program drives the ecosystem of Indian engineering students, educators towards building a stronger technical education community to elevate India's reputation as the leading technical force in the world. From teaching materials to design projects the university program brings advanced technology to universities to hone aspiring engineers through experiential learning while building real world applications on industry relevant technologies. Ground-breaking technologies from Texas Instruments fuel the passions of students and educators in university curriculum and labs across India. The COMPANY is University Program partner of Texas Instruments India and works with leading universities and engineering colleges in India, helping them improve curriculum

- B. UNIVERSITY is one of India's most renowned entities in engineering and technology education and often collaborates with leading companies in the area of curriculum enhancement in order to provide advanced technical education to students;
- C. The Parties are now desirous of collaborating on curriculum amendment subject to the terms contained herein:
1. A **steering committee** will be set up to monitor the activities of the MoU. The committee will consist of Ms. Apurva Varma from Sapience Consulting and The Registrar, Dr. D.H. Rao, Chairman BOS, Mr. Nayaz Ahmed, Fellow VTU. With mutual consent, the steering committee can be expanded to include additional members from the Parties. The steering committee will be the supreme body to govern implementation, continuation and termination of this MoU.
- Steering committee to meet on quarterly basis to discuss and analyze the progress of activities and milestones as per ANNEXURE B, & C.
 - Steering committee to send quarterly reports to Texas Instruments on the progress of activities and milestones as per ANNEXURE B, & C.

UNIVERSITY

[Handwritten Signature]



SAPIENCE CONSULTING

[Handwritten Signature]





Sapience
Consulting

2. Roles and Responsibilities:

a. COMPANY's Responsibilities:

1. COMPANY, along with steering committee, will work with UNIVERSITY for curriculum amendment.
2. After curriculum amendment as per ANNEXURE B , COMPANY will set up Texas Instruments Center of Excellence (CoE) at the UNIVERISTY as per ANNEXURE A.
3. COMPANY will conduct faculty development program (FDP) to increase awareness on the usage of Texas Instruments Analog and Embedded technologies
4. COMPANY, along with steering committee, will support and ensure the proper usage of CoE at VTU Regional Centers, Belgaum, Bangalore, Mysore, Gulbarga.
5. COMPANY to collaborate with UNIVERSITY in showcasing activities carried out at the COE.

b. UNIVERSITY Responsibilities:

1. UNIVERSITY to work with COMPANY for curriculum amendment as per Annexure B.
2. After curriculum amendment as per Annexure B, UNIVERSITY to provide infrastructure to set up "Texas Instruments Centre of Excellence" on Analog and Embedded technologies at the UNIVERSITY.
3. The UNIVERSITY will use the CoE to build technical capabilities through experiential learning on Texas Instruments Analog and Embedded technologies and also to develop teaching and learning content around Texas Instruments products.
4. UNIVERSITY will be responsible for purchasing any other equipment required for setting up the CoE.
5. UNIVERSITY will designate adequate technical staff to operate and maintain the CoE and ensure its proper usage
6. UNIVERSITY will support COMPANY in obtaining quarterly reports.
7. UNIVERSITY will collaborate with COMPANY in showcasing the activities carried out at the CoE.
8. UNIVERSITY will collaborate with COMPANY in creating awareness on Texas Instruments online resources (e.g. myTI, Webench etc) to strengthen activities at CoE.

UNIVERSITY

K. K. K.



SAPIENCE CONSULTING

A. P. A.





Sapience
Consulting

9. UNIVERSITY to encourage faculty and students to actively participate in TI e2e forum by publishing articles, blogs and collaborating with peers on Texas Instruments technology.
3. **Curriculum:** The UNIVERSITY, as per ANNEXURE B, along with COMPANY and steering committee, will introduce teaching and lab core courses on Texas Instruments analog and embedded technologies in their undergraduate engineering curriculum of its constituent and affiliated colleges. UNIVERSITY will publish the course curriculum on the UNIVERSITY website.
4. **Faculty Development Program (FDP):** UNIVERSITY will organize 4 FDP at the CoE for faculty mentors within 12 months of signing the MoU. UNIVERSITY will provide the infrastructure facility other than those mentioned in ANNEXURE A to conduct FDP. COMPANY to provide technical experts to conduct FDP.
5. This MOU constitutes the entire agreement between the parties in relation to the matters referred to in it and supersedes any previous agreement, documentation and correspondence between the parties in relation to those matters.
6. **Confidentiality**
- a. Each Party (the "Receiving Party") recognizes that in the course of the transactions envisaged between itself and the other Party (the "Disclosing Party"), it shall be privy to certain Confidential Information relating or belonging to such Disclosing Party/its affiliates. The Receiving Party therefore agrees that:
1. It shall not, without the prior written permission of the Disclosing Party, directly or indirectly disclose or cause to be disclosed any Confidential Information to any third party;
 2. It shall take all steps as may be reasonably necessary to protect the integrity of the Confidential Information and to ensure against any unauthorized disclosure thereof;
 3. It shall promptly inform the Disclosing Party of any potential or accidental disclosure of Confidential Information and shall take all steps, together with the Disclosing Party, to retrieve and protect the said Confidential Information;
 4. It shall ensure that all of the Receiving Party's faculty, employees, students, scholars, researchers and/or representatives or other persons who are given access to the Confidential Information shall at all times be

UNIVERSITY

[Signature]



SAPIENCE CONSULTING

[Signature]





Sapience
Consulting

bound by legally valid, written non-disclosure obligations at least as stringent as those contained herein;

5. And it shall use the Confidential Information only for the purpose for which it was provided and shall not profit from the same in an unauthorized manner to the exclusion of or to the detriment of the Disclosing Party/its affiliates.
- b. Upon the termination of this Agreement or upon demand by the Disclosing Party, whichever is earlier, the Receiving Party shall forthwith ensure the return to the Disclosing Party of all Confidential Information and copies thereof in the possession or under the control of the Receiving Party, its faculty, employees, students, scholars, researchers and their affiliates and shall thereafter provide written confirmation to the Disclosing Party affirming the Receiving Party's compliance with the foregoing.
- c. The term "Confidential Information" as used hereinabove means, with respect to the Disclosing Party/its affiliates, any and all information in written, representational, electronic, verbal or other form relating directly or indirectly to present or potential business, functionalities and specifications of the Disclosing Party's/its affiliates' products, devices or silicon (whether existing or planned), research/development, intellectual property, technology, designs, computer software, training methodologies, production techniques, testing plans and results, associates, customers, suppliers, competitors, regulatory matters, pricing, business development, marketing plans or strategy, sales matters/data, employees, financial matters or data, litigation/disputes and any information which might reasonably be presumed or identified to be proprietary or confidential in nature. However, "Confidential Information" would not include any such information which (i) is known to the public (through no act or omission of the Receiving Party in violation of this Agreement); (ii) can be demonstrated to have been lawfully acquired by the Receiving Party from an independent source having no obligation to maintain the confidentiality of such information; (iii) can be evidenced to have been known to the Receiving Party prior to its disclosure under this Agreement (iv) is required to be disclosed by governmental or judicial order, in which case the Receiving Party shall give the Disclosing Party prompt written notice, where possible, and use reasonable efforts to ensure that such disclosure is accorded confidential treatment and also to enable the Disclosing Party to seek a protective order or other appropriate remedy.
- d. Neither Party shall issue any press releases or website announcements or otherwise publicize the existence or any of the terms of this Agreement or other writing executed between the Parties without the prior written consent of the other Party.

UNIVERSITY

SAPIENCE CONSULTING





Sapience
Consulting

- e. The Parties acknowledge and agree that the above provisions relate to special, unique and extraordinary matters, and that violation of any of the terms of the same by the Party shall cause irreparable injury to the other Party/its affiliates and such other Party/its affiliates shall therefore be entitled to an interim injunction, restraining order or such other equitable relief as may be available to it under applicable law. These remedies are cumulative and are in addition to any other rights and remedies that the said other Party/its affiliates may have at law or in equity.

7. **Intellectual property**

- a. The term "Intellectual Property" as used herein means all intellectual property, whether or not capable of being registered, including but not limited to patents, copyrights, computer software, code, designs, chip topography rights, mask works, trade secrets, know how, techniques, methodologies, trademarks, service marks, logos, trade names and corporate names.
- b. It is hereby expressly clarified that any Intellectual Property independently created by UNIVERSITY / its faculty / students at the Texas Instruments Centre for Excellence which is not derived from and does not embody Texas Instruments Intellectual Property or Texas Instruments Confidential Information shall vest solely with UNIVERSITY, and Texas Instruments/Texas Instruments-India shall not be entitled to the same.

8. **Representations and warranties**

- a. The Parties hereby represent and warrant that:
1. Each of them has full power and authority to enter into this Agreement.
 2. The execution and delivery of this Agreement will not result in breach of any terms and conditions of any agreements, or constitute default under or violate any law, rule or regulation or any order, judgment or decree of any court, tribunal or governmental body.
- b. It is clarified that COMPANY or its affiliates does not provide any warranty or undertaking to UNIVERSITY or assume any obligations as regards the quantum or nature of Texas Instruments hardware and software development tools and educational materials that would be funded/provided by COMPANY.

UNIVERSITY



SAPIENCE CONSULTING





9. Indemnity

- a. Each Party (the "Breaching Party") shall indemnify and hold the other Party/its affiliates (the "Non-Breaching Party") harmless against any and all losses, claims, damages, liabilities, actions, proceedings, costs, charges, expenses and interests incurred by the Non-Breaching Party and arising out of any breach of the terms of this Agreement by the Breaching Party or out of any representation made by the Breaching Party being incorrect, misleading or materially incomplete in any manner whatsoever.

10. Relationship

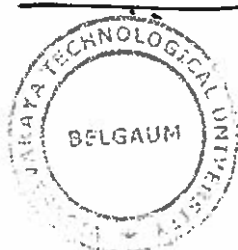
- a. UNIVERSITY understands and acknowledges that its relationship with COMPANY or its affiliates will be that of an independent principal and nothing in this Agreement is intended to or should be construed to create a partnership, joint venture, agency or employer-employee relationship and neither Party shall have any authority to bind the other or shall be deemed to have any authority of the other otherwise than as strictly provided herein.

11. Export control

- a. Each Party hereby agrees that unless prior authorization is obtained from the U.S. Department of Commerce, neither it nor its subsidiaries or affiliates shall knowingly export, re-export, or release, directly or indirectly, any technology, software, or software source code (as defined in Part 772 of the Export Administration Regulations of the U.S. Department of Commerce ("EAR")), received from the other Party or any of its affiliated companies/entities, or export, directly or indirectly, any direct product of such technology, software, or software source code (as defined in Part 734 of the EAR), to any destination or country to which the export, re-export or release of the technology, software, software source code, or direct product is prohibited by the EAR.
- b. Each Party understands and acknowledges that products, technology (regardless of the form in which it is provided), software or software source code, received from the other Party or any of its affiliates under this Agreement may be under export control of the United States or other countries. Each Party shall comply with the United States and other applicable non-U.S. laws and regulations governing the export, re-export and release of any products, technology, software, or software source code received under this agreement from the other Party or its affiliates. A Party shall not undertake on the other

UNIVERSITY

Kepaog



SAPIENCE CONSULTING

Adams





Sapience
Consulting

Party's/its affiliates' behalf any action that is prohibited by the EAR or other applicable US/non-US export control laws. Without limiting the generality of the foregoing, each Party specifically agrees that it shall not transfer or release products, technology, software, or software source code of the other Party or its affiliates to, or for use by, military end users or for use in military, missile, nuclear, biological, or chemical weapons end uses.

12. **FCPA and other compliances**

UNIVERSITY shall comply with the US Foreign Corrupt Practices Act, the Indian Prevention of Corruption Act, 1988 and all similar or related US and Indian laws, rules and regulations as may be enacted, amended or applicable from time to time and shall refrain from either directly or indirectly doing or refusing to do anything that may result in any liabilities or claims accruing against the COMPANY.

13. **Information Rights**

- a. UNIVERSITY shall, if requested by COMPANY or its affiliates, forthwith provide COMPANY nominees access to all information, records, books and documents as may be required by COMPANY to verify UNIVERSITY's and each Visiting Faculty Member's compliance with the provisions of this Agreement and other documentation that may be executed between COMPANY and UNIVERSITY/or the associated Faculty Member. COMPANY's nominees participating in such exercise shall be entitled to make copies of such information, records, books and documents and to interview the relevant UNIVERSITY personnel and associated Faculty Members. COMPANY undertakes that in the event that it incidentally becomes privy to any proprietary or secret/non-public information belonging to UNIVERSITY or its affiliates in the course of the above exercise which has no bearing on COMPANY's assessment of UNIVERSITY's compliance with the specified provisions hereof, COMPANY shall keep such information confidential and not disclose the same to any third parties or otherwise use the same to the exclusion or detriment of UNIVERSITY.

UNIVERSITY



SAPIENCE CONSULTING





Sapience
Consulting

14. Term and Termination

- a. This Agreement shall become effective from the date hereof and shall remain in force unless terminated in accordance with the provisions of this Section. This Agreement may be terminated by a Party hereto if another Party commits material breach or default in performance of its obligations hereunder and the same (if capable of being remedied), has not been cured within 30 (thirty) days of receipt of written notice of such breach or default.
- b. Any Party may terminate this agreement without specifying any reason by providing 90 days' prior written notice in that behalf to the other Parties.
- c. The termination hereof shall not serve to release a Party from the performance of such of its obligations as may have arisen prior to termination. Further, the provisions of Sections [6, 7, 11, 15] shall continue to remain binding notwithstanding the termination or expiry hereof.

15. Governing law and dispute resolution

- a. This Agreement shall be governed and construed in accordance with the laws of India.
- b. If any dispute arises between the Parties during the subsistence of this Agreement or thereafter, in connection with the validity, interpretation, implementation or alleged breach of any provision of this Agreement, the dispute shall be referred to a sole arbitrator, who shall be nominated by mutual consent. If the Parties are unable to agree upon the nomination of a sole arbitrator within 30 days of the dispute having arisen, each Party to the dispute (in case it is bipartite) shall nominate one arbitrator and the two arbitrators so nominated will appoint the third, presiding arbitrator. If the dispute is a tripartite one, each of the Parties will nominate one out of the total of three arbitrators. The place of arbitration shall be Bangalore. The arbitration proceeding shall be governed by the Arbitration & Conciliation Act, 1996. The arbitration proceedings shall be in the English language.
- c. Subject to the provisions of Section 15b above, the courts at Bangalore shall enjoy sole jurisdiction over matters related hereto. It is hereby clarified that nothing herein or in Section 15b above shall be construed to prevent COMPANY /its affiliates from approaching courts in any jurisdiction deemed appropriate by them for the purpose of obtaining injunctive and equitable relief.

UNIVERSITY

Kuvempu

SAPIENCE CONSULTING

Apurva





Sapience
Consulting

16. General Provisions

- a. Any notice under this Agreement will be in writing and will be: (i) given in person; or (ii) sent by facsimile or electronic mail and confirmed by sending through registered post or nationally recognized courier within three (3) calendar days thereafter, or (iii) sent by registered post or nationally recognized courier, with postage prepaid, to the address specified below or to any other address that may be designated by a party by prior written notice. Any notice delivered by facsimile or electronic mail will be deemed received the day it is sent. Any notice or other communication sent by registered post or nationally recognized courier will be effective as of the date of the receipt.
- b. Entire Agreement: This Agreement, including the Schedules hereto, constitutes the entire agreement between the Parties relating to its subject matter and, this Agreement supersedes any and other prior agreements, communications or understandings, whether oral or written, pertaining to the subject matter hereof.
- c. Amendment to Agreement: This Agreement may not be amended, varied, waived, explained, added to, extended or changed in any way except in writing, signed by a person duly authorized to execute such modification or amendment on behalf of either Party.
- d. Waiver: Any failure by either party to exercise its rights or any delay, forbearance or indulgence by either party in exercising any rights under this agreement shall not operate as a waiver of that right or preclude its exercise at any subsequent time or on any subsequent occasion.
- e. Severability: In the event that any one or more of the provisions contained herein are, for any reason, discovered to be unenforceable in any respect under the laws of India, the remainder of this Agreement shall be in full force and effect.
- f. No Exclusivity: Nothing herein shall be deemed to restrict any Party from entering into similar arrangements with any third parties.
- g. Force Majeure: Neither Party shall have any right to terminate this Agreement for any breach caused by reason of, nor shall either Party be liable for any loss or damage caused to the other by reason of any failure or delay of such Party in meeting its obligations under this Agreement which is due to any riot, strike, fire, accident, explosion, flooding, terrorism or malicious damage not attributable to the default or negligence of such Party

UNIVERSITY



SAPIENCE CONSULTING





Sapience Consulting

or to any other cause (whether similar to the foregoing or not) not so attributable. Each Party shall forthwith notify the other of any event likely to cause such failure or delay immediately upon the same having come to such Party's knowledge. Provided that in the event that any event of *force majeure* which prevents either Party from fulfilling its obligations under this Agreement persists for a continuous period of 45 days, either Party may forthwith terminate this Agreement and the consequences of such termination shall be the same as termination under Section 14 (d).

IN WITNESS WHEREOF, the Parties have caused this MOU to be signed by their duly authorized representatives as of the MOU effective date above.

Visvesvaraya Technological University

Sapience Consulting

By: Kepaag

By: Apurva Varma

Name: Dr. K.E. PRAKASH

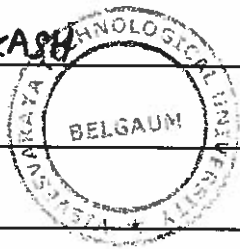
Name: Apurva Varma

Title: Registrar

Title: Director-Operations

Date: 20th July, 2015

Date: 20th July, 2015



Witness 1

Witness 2

By: Syath

By: Dr. D.H. Rao

Name: SANJAY SRIVASTAVA

Name: Dr. D.H. Rao

Title: DIRECTOR UNIVERSITY PROGRAM
TI-INDIA

Title: Former DR of VTU

Date: 20th July 2015

Date: 20th July 2015

UNIVERSITY Kepaag

SAPIENCE CONSULTING Apurva





Sapience
Consulting

ANNEXURE A : Definition of Centre of Excellence(CoE)

CoE will comprise of labs as per below list

Sl. No	Lab Name	Lab composition
1	MSP 430 Lab	20 MSP430 G2 Launchpads OR
		10 MSP430 Launchpad + 2 MSP-EXP430F5529 experimenter kit
2	TIVA Lab	20 EK-TM4C123GXL TIVA Launchpad
		10 TIVA Launchpads + 2 DK-TM4C123G kit OR
3	Analog Attach Lab	15 Launchpads (MSP430 G2/ LAUNCHXL F28027 / EK-TM4C123GXL TIVA) and 5 Booster Packs (430BOOST-SENSE1/430BOOST-TMP006/BOOSTXL-SENSHUB/ BP-EDUC-01)
4	Connectivity Attach Lab	6 EZ430-RF256x Bluetooth Evaluation Kit OR
		6 MSP Launch Pad (MSP-EXP430F5529) + 6 CC3100boost OR
		12 MSP-EXP430G2 + 6 CC110L Booster Packs OR CC2530EMK/CC2520EMK with MSP430 Experimenter Boards for 2.4GHz Zigbee applications.
5	Analog Lab	6 ASLK PRO kits
Other material that may be needed in Lab		
1	IDE	Code Composer Studio
		CCSv5.0 or above
Teaching & Branding Material		
1	Teaching ROMs on TI platforms	
2	Textbooks on TI technologies	
3	Lab Manuals available	
4	Texas Instruments Lab posters, and collaterals	

- UNIVERSITY to receive tools as per above definition of CoE from COMPANY.
- UNIVERSITY to provide necessary instruments e.g. function generators, power supplies, oscilloscopes, computers etc at the CoE.
- COMPANY to provide Texas Instruments branding material to UNIVERSITY to be placed at the CoE.
- UNIVERSITY to give acknowledgement letter to COMPANY, as per ANNEXURE D

UNIVERSITY

K. R. S. G.

SAPIENCE CONSULTING

A. P. S.





Sapience
Consulting

ANNEXURE B – Curriculum Amendment to include TI Technology

1. COMPANY will provide curriculum structure and content to UNIVERSITY to take it through its decision making body (Board of Studies, Academic council or as deemed fit by the UNIVERSITY) for incorporation into UG core courses.
2. Before curriculum amendment, COMPANY will identify theory and lab courses where Texas Instruments technology will be incorporated.
3. UNIVERSITY as an apex technical body focused on bringing application oriented innovative curriculum for the benefit of all associated engineering colleges will ensure curriculum amendment as per ANNEXURE G to include teaching and lab courses on market relevant cutting edge Texas Instruments analog and embedded technologies in its undergraduate engineering core curriculum (not as elective subject) to be adopted by all constituent and affiliated colleges.
4. It is the responsibility of the UNIVERSITY to reflect the curriculum amendment on its website that could be accessed by the larger education community across India for the benefit of the ecosystem and be the guiding example of industry relevant curriculum. UNIVERSITY will share the website links, circular, course content with COMPANY.
5. It is a responsibility of the COMPANY to ensure that curriculum amendment and content are shared with Texas Instruments in the form of circular and website announcement.
6. It will be the responsibility of the COMPANY to provide Texas Instruments teaching material and online resources available on Texas Instruments website to UNIVERSITY & affiliated colleges.
7. UNIVERSITY and affiliated colleges may encourage its faculty to use available teaching material and develop textbooks and other course material for the benefit of student community.

UNIVERSITY

SAPIENCE CONSULTING





Sapience
Consulting

ANNEXURE C – Faculty Development Program (FDP)

1. COMPANY will conduct 4 FDP in CoE established at UNIVERSITY within 12 months' time frame after signing the MOU.
2. UNIVERSITY will ensure identification of 40 relevant faculty to be trained in each FDP. The trained faculty will be designated as mentors/technical experts on Texas Instruments technology at the UNIVERSITY.
3. UNIVERSITY will provide hospitality for participating faculty, infrastructure, lab facility (as mentioned in ANNEXURE A) to conduct the FDP.
4. COMPANY will provide technical expertise.
5. UNIVERSITY will carry out publicity to draw participation for FDP.
6. COMPANY will share event announcement with Texas Instruments at least two weeks prior to the event.
7. COMPANY will share photographs, registration documents and technical experts' remark with consolidated feedback.

UNIVERSITY

Kepang



SAPIENCE CONSULTING

Apuwa





Sapience Consulting

ANNEXURE D: Acknowledgement letter

(To be printed on University letter-head)

To,
Texas Instruments India University Program
Texas Instruments India
Bagmane Tech Park
CV Raman Nagar
Bangalore – 560093

Sub: - Texas Instruments Sponsored _____ CoE.

Dear Sir,

On Behalf of _____ <name of the UNIVERSITY>. We acknowledge that COMPANY has provided hardware platforms as listed in the table below towards setting up the CoE. The CoE has been set up at <Address>.

S.NO.	Name or Description of the Hardware platform	Quantity

As committed in the MoU, Texas Instruments CoE will be set-up with the above mentioned Hardware platforms and will be used for curriculum activities and research at the UNIVERSITY.

We also assure that we will maintain the branding of Texas Instruments CoE in the UNIVERSITY as per the MOU guidelines and will use the teaching material given to us by the COMPANY.

Thank You,

With Regards,

Signature of the Registrar and Coordinator of Texas Instruments Program with Seal

UNIVERSITY *Kereang*

SAPIENCE CONSULTING *Apurna*





Sapience
Consulting

ANNEXURE E: Letter from BOS

(To be printed on college letter-head)
Letter date/Ref Number

To,
Texas Instruments India University Program
Texas Instruments India
Bagmane Tech Park
CV Raman Nagar
Bangalore – 560093

Sub: Approval of curriculum in Linear Integrated Circuits and Embedded Systems

REF:

Vide reference cited above, it is to confirm that, effective immediately, the University has made changes to the curriculum structure and content for following courses

1. Theory Course Name/Number/Semester
2. Lab Course Name/Number/Semester

The modified course for both theory and lab is enclosed herewith and will be applicable from the academic year ___ for all constituent and affiliated Engineering colleges under <UNIVERSITY>.

Enclosures:

Approved course content for (total ___ pages)

1. Linear Integrated Circuits Theory (Course Numbers)
2. Linear Integrated Circuits Lab (Course Numbers)
3. Embedded Systems Theory (Course Numbers)
4. Embedded Systems Lab (Course Numbers)

Thank You,
With Regards,
Signature and Seal
Chairman, Board of Studies and Registrar
Rajasthan Technical University

UNIVERSITY

SAPIENCE CONSULTING





Sapience
Consulting

ANNEXURE F: Timeline for FDP:

University & Company will strive to achieve their quarterly goals in providing training to the relevant faculty of constituent & affiliated as detailed below:

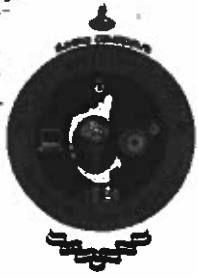
S. No	Minimum no. of affiliated institutions covered	Minimum no. of participants	Tentative timeline	COMPANY & UNIVERSITY shall ensure the following deliverables to Texas Instruments for each each FDP
1	50	40	To be mutually discussed and decided	<ul style="list-style-type: none">• FDP Announcement• List of Faculty Mentors attending the FDP.• Photographs taken during the FDP• Attendance sheet, registration sheet consisting of faculty name, Institute details with contact number and e-mail id.• Technical experts' remark with consolidated feedback from participating faculty mentors.
2	50	40	-do-	
3	50	40	-do-	
4	50	40	-do-	

UNIVERSITY



SAPIENCE CONSULTING





Sapience
Consulting

ANNEXURE G: Approved Curriculum by BOS, VTU

Linear Integrated Circuits and its Applications

Abstract:

Analog Electronics occupies a very special and significant place in modern day systems. In the past decade, India has seen the emergence of a number of system design companies. Manufacturing of electronic products has also received a significant boost. These companies look for system-level design skills in both analog and digital domains. Currently, Analog System design is not emphasized in the conventional way of teaching analog. We believe it is important to bridge this gap at an early stage in the undergraduate coursework.

In this course the focus is on system design. This will prepare the students for the real world, where a system designer uses the analog ICs as building blocks. Starting with understanding the characteristics of an op-amp, which is a basic building block in Analog Systems, it will cover the design and test of practical circuits based on Op-Amps. This will followed by study of comparators, data converters, multipliers, voltage regulators and their implementation. The final section will cover more advanced applications of analog systems.

Prerequisites

Circuit & Network Theory

Course Objectives:

1. Basic concepts of op-AMPs characteristics and specifications
2. Op-AMP applications to signal conditioning for amplifiers, filters and oscillators
3. Op-AMP applications for comparators and data conversions
4. Op-AMP for advanced applications such as PLL, VCOs, V-I converters, I-V converters, AGC,AVC, analog multipliers

Course Name	Linear Integrated Circuits and its applications (4 Credits)
Level	Intermediate
Credits	L – T – P 3 – 0 – 2
Total hours	(40 – 45) + 15 sessions of lab practical
Semesters	III/IV
Branches	ECE/EEE/ETE/BME/RAE/I&CE

UNIVERSITY

Kepang

SAPIENCE CONSULTING

Apurva





Sapience
Consulting

Course outcomes:

1. Students will be able to learn about the operational amplifiers and its characteristics as well as various types of op-amps.
2. Students will acquire the ability to design and test practical circuits for amplifiers, filters and oscillators.
3. Students will be able to analyze the operation of comparators, data convertors and implementation of the same.
4. Students will be able to learn the functioning of PLL, VCO, V-I, I-V converters, AGC, AVC and analog multipliers and implement them for suitable applications

Theory Course:

UNIT-I: Introduction to Operational Amplifiers and Characteristics

Introduction, Block diagram, characteristics and equivalent circuits of an ideal op-amp, various types of Operational Amplifiers and their applications, Power supply configurations for OP-AMP applications, inverting and non-inverting amplifier configurations.

UNIT-II: The Practical op-amp Introduction, Input offset voltage, offset current, thermal drift, Effect of variation in power supply voltage, common-mode rejection ratio, Slew rate and its Effect, PSRR and gain-bandwidth product, frequency limitations and compensations, transient response, interpretation of TL082 datasheet.

UNIT-III: Amplifiers and Oscillators Summing amplifier, Integrators and differentiators, Instrumentation amplifier, Differential input and differential output amplifier, Voltage-series feedback amplifier, Voltage-shunt feedback amplifier, Log/ Antilog amplifier, isolation amplifiers, Triangular/rectangular wave generator, phase-shift oscillators, Wein bridge oscillator, analog multiplier-MPY634, VCO.

UNIT-IV: Active Filters

Characteristics of filters, Classification of filters, Magnitude and frequency response, Butterworth 1st and 2nd order Low pass, High pass and band pass filters, Chebyshev filter characteristics, Band reject filters, notch filter, All pass filters, self-tuned filters.

UNIT-V: Comparators and Converters:

Comparator, Zero Crossing Detector, Monostable and Astable Multivibrator, Schmitt Trigger, Voltage limiters, Clipper and clampers, Absolute value output circuit, Peak detector, Sample and hold Circuit, Precision rectifiers, Voltage-to-current converter, Current-to-voltage converter.

UNIVERSITY



SAPIENCE CONSULTING





Sapience
Consulting

UNIT-VI: Advanced applications

Applications as Frequency Divider, PLL, AGC,AVC using op-AMP and analog multipliers, Amplitude modulation using analog multiplier, Frequency Shift Keying, simple OP-AMP Voltage regulator, Fixed and Adjustable Voltage Regulators, Dual Power supply, Basic Switching Regulator and characteristics of standard regulator ICs – TPS40200, TPS40210, ADC TL0820 & DAC- 7821.

Lab course:

Tools Required –Function Generator, Power Supply, TL082, MPY634, ASLK Pro, Oscilloscopes, Connecting wires.

List of Experiments:

1. Study the characteristics of negative feedback amplifier

Aim:

Design the following amplifiers:

- a) A unity gain amplifier
- b) A non-inverting amplifier with a gain of 'A'
- c) An inverting amplifier with a gain of 'A'

Apply a square wave of fixed amplitude and study the effect of slew rate on the three type of amplifiers.

Applications:

- Amplifying bioelectric potentials (ECG, EEG, EMG, EOG) and piezoelectric with high output impedance.
- Amplifying sensor output signals (temperature sensors, humidity sensors, pressure sensors etc.)

Sample questions

Explain the need for unity gain amplifier.

Advantages of op-amp based amplifiers as compare to BJT amplifiers.

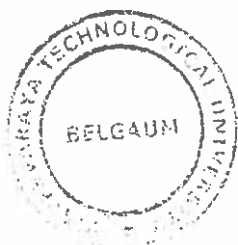
Mention the applications for inverting and non-inverting amplifiers.

Give your inference on the frequency response of the amplifier.

Give the significance of gain-bandwidth product.

UNIVERSITY

Kepang



SAPIENCE CONSULTING

Ahmed





2. Design of an instrumentation amplifier

Aim:

Design an instrumentation amplifier of a differential mode gain of 'A' using three amplifiers.

Applications:

- Used in measuring instruments designed for achieving high accuracy and high stability.
- Used for amplifying low voltage, low frequency and higher output impedance signals.

Sample questions

Explain the need for two stages in any instrumentation amplifier.

Why CMRR is high for instrumentation amplifiers?

Give some examples for low voltage, low frequency and higher output impedance signals.

How does the tolerances of resistors affect the gain of the instrumentation amplifier?

3. Study the characteristics of regenerative feedback system with extension to design an astable multivibrator

Aim:

Design and test an astable multivibrator for a given frequency.

Applications

- It can be used in signal generators and generation of timing signals.
- It can be used in code generators and trigger circuits.

Sample question

Discuss the difference between astable and bi-stable multivibrator.

Discuss the frequency limitation of astable multivibrator.

Discuss the various applications of bi-stable multivibrator.

4. Study the characteristics of integrator circuit

Aim:

Design and test the integrator for a given time constant.

UNIVERSITY

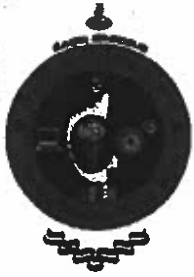
Kepang



SAPIENCE CONSULTING

Apurva





Sapience Consulting

Applications

- Used in function generators, PI/PID controllers.
- Used in analog computers, analog-to-digital converters and wave-shaping circuits.
- Used as a charge amplifier.

Sample questions

Compare the output with that of ideal integrator.

How will you design a differentiator and mention its drawback.

Discuss the limitation of the output voltage of the integrator.

How will you obtain drift compensation in an inverting integrator?

.....

5. Design of Analog filters – I

Aim:

Design a second order butterworth band-pass filter for the given higher and lower cut-off frequencies.

Applications:

- Used in signal conditioning circuits for processing audio signals.
- Used in measuring instruments.
- Used in radio receivers.

Sample questions

Discuss the effect of order of the filter on frequency response.

How will you vary Q factor of the frequency response.

Discuss the need for going to Sallen Key circuit.

Compare the performance of Butterworth filter with that of Chebyshev filter.

.....

6. Design of Analog filters – II

Aim:

Design and test a notch filter to eliminate the 50Hz power line frequency.

Applications

- Used for removing power supply interference.
- Used for removing spur in RF signals.

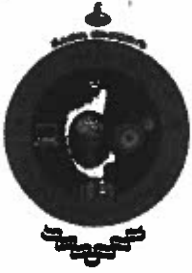
UNIVERSITY

Kepang

SAPIENCE CONSULTING

Amur





Sapience
Consulting

Sample questions

Explain the effect of supply frequency interference while amplifying sensor signals.
Suggest a method for adjusting the Q factor of the frequency response of notch filter.
What is the purpose of going for Twin T notch filter circuit?

.....

7. Design of a self-tuned Filter

Aim: Design and test a high-Q Band pass self-tuned filter for a given center frequency.

Applications:

- Used in spectrum analyzers

Sample Question:

Discuss the effect of the harmonics when a square wave is applied to the filter
Determine the lock range of the self-tuned filter

.....

8. Design of a function generator

Aim:

Design and test a function generator that can generate square wave and triangular wave output for a given frequency.

Applications:

- Used in testing, measuring instruments and radio receivers.
- Used for obtaining frequency response of devices and circuits.
- Used for testing and servicing of Electronic equipment's.
- Used in Electronic musical instruments.
- Used for obtaining audiograms (Threshold of audibility Vs frequency)

Sample questions

Discuss typical specifications of a general purpose function generator.
How can you obtain reasonably accurate sine wave from triangular wave.
Discuss the reason for higher distortion in sine wave produced by function generators.
What do you mean by Duty cycle and how can you vary the same in a function generator?

UNIVERSITY

Keerthi



SAPIENCE CONSULTING

Apurva





Sapience
Consulting

9. Design of a Voltage Controlled Oscillator

Aim:

Design and test voltage controlled oscillator for a given specification (voltage range and frequency range).

Applications:

- Used in Phase Lock Loop (PLL) circuits.
- Used in frequency modulation circuits.
- Used in Function generators
- Used in frequency Synthesizers of Communication equipment's.

Sample Questions

Discuss the following characteristics of a voltage controlled Oscillator.

- i) Tuning range
- ii) Tuning gain and
- iii) Phase noise

Compare the performances VCO based Harmonic Oscillators and Relaxation Oscillators
What are the various methods adopted in controlling the frequency of oscillation in VCOs
Discuss any one method of obtaining FM demodulation using a VCO.



10. Design of a Phase Locked Loop(PLL)

Aim:

Design and test a PLL to get locked to a given frequency 'f'. Measure the locking range of the system and also measure the change in phase of the output signal as input frequency is varied with in the lock range.

Applications:

- Used in tracking Band pass filter for Angle Modulated signals.
- Used in frequency divider and frequency multiplier circuits.
- Used as Amplifiers for Angle Modulated signals.
- Used in AM and FM Demodulators
- Used in Suppressed Carrier Recovery Circuits

UNIVERSITY



SAPIENCE CONSULTING





Sapience
Consulting

Sample Questions:

Draw the block diagram of a PLL based divider and multiplier and explain the functions performed by each block.

Distinguish between Lock range and Capture Range, Explain the method of estimating the same for a given PLL circuit.

Discuss the differences between Analog Phase Lock Loop and Digital Phase Lock Loop.

.....

11. Automatic Gain Control (AGC) Automatic Volume Control (AVC)

Aim:

Design and test an AGC system for a given peak amplitude of sine-wave output.

Applications

- Used in AM Receivers
- Used as Voice Operated Gain Adjusting Device (VOGAD) in Radio Transmitters
- Used in Telephone speech Recorders
- Used in Radar Systems

Sample Questions

Explain clearly the need for AGC in AM Receivers.

Draw the block diagram of feedback and feed forward AGC systems and explain the functions of each block.

Discuss any one gain control mechanism present in biological systems.

How can you use AGC in a Received Signal Strength Indicator (RSSI)

.....

12. Design of a low drop out regulator

Aim:

Design and test a Low Dropout regulator using op-amps for a given voltage regulation characteristic and compare the characteristics with TPS7250 IC

Applications:

- Used in Power Supply of all Electronic Instruments and Equipment's
- Used as Reference Power Supply in Comparators
- Used in Emergency Power Supplies
- Used in Current Sources

UNIVERSITY

Kesava



SAPIENCE CONSULTING

Apurva





Sample Questions

Distinguish between Load Regulation and Line Regulation.
Mention some of the other important parameters in selecting a LDO.
What is power supply rejection ratio (PSRR)?

.....

13. DC-DC Converter

Aim:

Design of a switched mode power supply that can provide a regulated output voltage for a given input range using the TPS40200 IC

Applications:

- Used in DSL/Cable Modems
- Used in Distributed Power Systems

Sample Questions

Discuss the effect of varying the input voltage for a fixed regulated output voltage over the duty cycle of PWM.

Books and other References:

1. Data Sheet: <http://www.ti.com/lit/ds/symlink/tl082.pdf>
2. Application Note:
3. MPY634 Data Sheet: <http://www.ti.com/lit/ds/symlink/mpy634.pdf>
4. Application Note:
5. ASLK Pro Manual: ASLK

UNIVERSITY

Kepang



SAPIENCE CONSULTING

Apurva





ANNEXURE G continued...

**Introduction to Microcontrollers for Embedded Systems
TIVA Based**

Abstract

Modern day Embedded Systems curriculum requires an application and Systems Design approach balancing the performance, connectivity requirements and system cost with an eye on power. This course is designed to inculcate this perspective in the students using Cortex-M4 based Tiva, an industry standard hardware platform.

The course helps us to understand 32-bit architecture and its programming considerations using C language. Later part is focused on programming various inbuilt features of the platform with more focused approach on analog and digital interfacing concepts and related protocols. Embedded systems whether they are standalone or networked need various communication interfaces and standards so that they communicate and process data from external sensors and actuators. It will cover how to connect the device to external peripherals including those needed for internet connectivity.

Course objectives

- Teach basic architecture of 32-bit microcontrollers
- Understand hardware interfacing concepts to connect digital as well as analog sensors while ensuring low power considerations.
- Reviews and implement the protocols used by microcontroller to communicate with external sensors and actuators in real world.
- Understanding Embedded Networking concepts based upon connected MCUs

Prerequisite

Fundamentals of Digital systems
Basic C programming

UNIVERSITY

Kepa ag



SAPIENCE CONSULTING

Apurna





Sapience
Consulting

Course details

Course Name	Introduction to Microcontrollers for Embedded Systems
Course Type	CORE
Credits	L – T – P 3 – 0 – 1
Semester	III/IV
Branches	CSE/ECE/ETE/EEE/BME/I&C
Existing courses that can be mapped	Microcontroller and Interfacing/Microprocessor and Interfacing/Introductory embedded system course
Brief Course	
UNIT- I	Introduction to Embedded systems
UNIT-II	Microcontroller Fundamentals for Basic Programming
UNIT-III	Timers, PWM and Mixed Signals Processing
UNIT-IV	Communication protocols and Interfacing with external devices
UNIT-V	Embedded networking and Internet of Things

Theory Course:

UNIT-I: Microprocessors for embedded systems

Embedded system overview and applications, features and architecture considerations-ROM, RAM, timers, data and address bus, Memory and I/O interfacing concepts, memory mapped I/O. CISC Vs RISC design philosophy, Von-Neumann Vs Harvard architecture, instruction set, instruction formats, and various addressing modes of 32-bit. Fixed point and floating point arithmetic operations.

Introduction ARM architecture and Cortex – M series, Introduction to the Tiva family viz. TM4C123x & TM4C129x and its targeted applications, Tiva block diagram, address space, on-chip peripherals (analog and digital) Register sets, Addressing modes and instruction set basics.

UNIT-II: Microcontroller Fundamentals for Basic Programming

I/O pin multiplexing, pull up/down registers, GPIO control, Memory Mapped Peripherals, programming System registers, Watchdog Timer, need of low power for embedded systems, System Clocks and control,

UNIVERSITY _____



SAPIENCE CONSULTING _____





Sapience
Consulting

Hibernation Module on Tiva, Active vs Standby current consumption. Introduction to Interrupts, Interrupt vector table, interrupt programming.

Case Study: Tiva based embedded system application bringing up the salient features of GPIO, Watchdog timer, etc.

UNIT- III: Timers, PWM and Mixed Signals Processing

Timer, Basic Timer, Real Time Clock (RTC), Timing generation and measurements, Analog interfacing and data acquisition: ADC, Analog Comparators, DMA, Motion Control Peripherals: PWM Module & Quadrature Encoder Interface (QEI).

Case Study: Tiva based embedded system application using ADC & PWM.

UNIT-IV: Communication protocols and Interfacing with external devices Synchronous/Asynchronous interfaces (like UART, SPI, I2C, USB), serial communication basics, baud rate concepts, Interfacing digital and analog external device, I2C protocol, SPI protocol & UART protocol. Implementing and programming I2C, SPI & UART interface using Tiva. CAN & USB interfaces on Tiva platform. Case Study: Tiva based embedded system application using the interface protocols for communication with external devices "Sensor Hub BoosterPack"

UNIT V: Embedded networking and Internet of Things

Embedded Networking fundamentals, Ethernet, TCP/IP introduction IoT overview and architecture, Overview of wireless sensor networks and design examples. Various wireless protocols and its applications: NFC, ZigBee, Bluetooth, Bluetooth Low Energy, Wi-Fi. Adding Wi-Fi capability to the Microcontroller, Embedded Wi-Fi, User APIs for Wireless and Networking applications Building IoT applications using CC3100 user API: connecting sensor devices using Tivaware sensor library.

Case Study: Tiva based Embedded Networking Application: "Smart Plug with Remote Disconnect and Wi-Fi Connectivity"

UNIVERSITY



SAPIENCE CONSULTING





Sapience
Consulting

Lab course:

1. Interfacing and programming GPIO ports in C using Tiva (blinking LEDs , push buttons)
2. Interrupt programming examples through GPIOs
3. Use Hibernation mode and wake on RTC interrupt
4. PWM generation using PWM Module on Tiva
5. Interfacing potentiometer with Tiva GPIO
6. PWM based Speed Control of Motor controlled by potentiometer connected to Tiva GPIO
7. Connect the Tiva to terminal on PC and echo back the data using UART
8. Interfacing an accelerometer with Tiva using I2C
9. Experiment on USB (Sending data back and forth across a bulk transfer-mode USB connection.)
10. Using IQmath Library for implementing Low pass FIR filter
11. Review of User APIs for TI CC3100 & Initialization and Setting of IP addresses
12. A basic Wi-Fi application – Communication between two Tiva based sensor nodes using TIVA sensor library in TivaWare
13. Setting up the CC3100 as a HTTP server

Books and other References:

Embedded Systems: Real-Time Interfacing to ARM Cortex-M Microcontrollers, 2014, ISBN: 978-1463590154.

http://processors.wiki.ti.com/index.php/Hands-On_Training_for_TI_Embedded_Processors

http://processors.wiki.ti.com/index.php/MCU_Day_Internet_of_Things_2013_Workshop

http://www.ti.com/ww/en/simplelink_embedded_wi-fi/home.html

UNIVERSITY

Kepang



SAPIENCE CONSULTING

Apurva





Sapience
Consulting

ANNEXURE G continued...

Introduction to Microcontrollers for Embedded Systems-MSP430

Abstract

Modern day Embedded Systems curriculum requires an application and Systems Design approach balancing the low power needs, performance, connectivity requirements and system cost. This course is designed to inculcate this perspective in the students while introducing them to Microcontrollers using MSP430, an industry standard hardware platform.

The course helps us to understand 16-bit architecture and its programming considerations using C language. Later part is focused on programming various inbuilt features of the platform with more focused approach on analog and digital interfacing concepts and related protocols. The considerations in keeping the System power consumption low are addressed along the way. Embedded systems whether they are standalone or networked need various communication interfaces and standards so that they communicate and process data from external sensors and actuators. It will cover how to connect the device to external peripherals including those needed for internet connectivity.

Course objectives

Teach basic architecture of 16-bit microcontrollers

Understand hardware interfacing concepts to connect digital as well as analog sensors while ensuring low power considerations.

Reviews and implement the protocols used by microcontroller to communicate with external sensors and actuators in real world.

Understanding Embedded Networking concepts based upon connected MCUs.

Prerequisite

Fundamentals of Digital systems

Basic C programming

UNIVERSITY

Keerag



SAPIENCE CONSULTING

Apurva





Sapience
Consulting

Course details

Course Name	Introduction to Microcontrollers for Embedded Systems
Level	Intermediate
Credits	L – T – P 3 – 0 – 1
Semesters	III/IV
Branches	CSE/ECE/EEE/ETE/BME/I&C
Existing courses that can be mapped	Microcontroller and Interfacing/Microprocessor and Interfacing/Introductory embedded system course
Brief Course	
UNIT- I	Fundamentals of microcontroller for Embedded systems
UNIT-II	Peripheral and programming for microcontrollers
UNIT-III	Timers, PWM and Mixed Signal peripherals
UNIT-IV	Communication and other external peripherals
UNIT-V	Embedded Networking and Internet of Things

Theory:

UNIT-I: Fundamentals of microcontrollers for Embedded Systems

8 hrs

Embedded system overview, applications, features and architecture considerations - ROM, RAM, timers, data and address bus, I/O interfacing concepts, memory mapped I/O. CISC Vs RISC design philosophy, Von-Neumann Vs Harvard architecture. MSP430x5x series block diagram, address space, on-chip peripherals (analog and digital), and Register sets. Instruction set, instruction formats, and various addressing modes of 16-bit microcontroller; MSP430 specifics. Variants of the MSP430 family viz. MSP430x2x, MSP430x4x, MSP430x5x and their targeted applications, Sample embedded system on MSP430 microcontroller.

UNIT-II: Peripherals and programming for Microcontroller

10 hrs

Memory Mapped Peripherals, programming System registers, I/O pin multiplexing, pull up/down registers, GPIO control. Interrupts and interrupt programming. watchdog timer. system clocks. Low Power aspects of MSP430: low power modes, Active vs Standby current consumption, FRAM vs Flash for low power & reliability.

UNIVERSITY

Kepang

SAPIENCE CONSULTING

Apurva





Sapience
Consulting

Case Study: MSP430 based embedded system application bringing up the salient features of GPIO, Watchdog timer, low power, FRAM.

Advance Topic: Energy and power consumption estimation for embedded board

UNIT-III: Timers, PWM and Mixed Signals Peripherals

8 hrs

Timer & Real Time Clock (RTC), PWM control, timing generation and measurements. Analog interfacing and data acquisition: ADC and Comparator in MSP430, data transfer using DMA.

Power considerations: Programming for optimal power consumption while using peripherals, Using MSP430 peripheral intelligence in power management

Case Study: MSP430 based embedded system application using ADC & PWM demonstrating peripheral intelligence. "Remote Controller of Air Conditioner Using MSP430"

UNIT-IV: Communication and other external peripherals

8 hrs

Serial communication basics, Synchronous/Asynchronous interfaces (like UART, USB, SPI, and I2C). UART protocol, I2C protocol, SPI protocol. Implementing and programming UART, I2C, SPI interface using MSP430, Interfacing external devices.

Case Study: MSP430 based embedded system application using the interface protocols for communication with external devices: "A Low-Power Battery less Wireless Temperature and Humidity Sensor with Passive Low Frequency RFID"

UNIT-V: Embedded Networking and Internet of Things

6 hrs

IoT overview and architecture, Overview of wireless sensor networks and design examples. Various wireless connectivity: NFC, ZigBee, Bluetooth, Bluetooth Low Energy, Wi-Fi.

Adding Wi-Fi capability to the Microcontroller, Embedded Wi-Fi, User APIs for Wireless and Networking applications, Building IoT applications using CC3100 user API for connecting sensors.

Case Study: MSP430 based Embedded Networking Application: "Implementing Wi-Fi Connectivity in a Smart Electric Meter"

UNIVERSITY

Kepang

SAPIENCE CONSULTING

Apurva





Sapience
Consulting

Lab course:

1. Interfacing and programming GPIO ports in C using MSP430 (blinking LEDs , push buttons)
2. Usage of Low Power Modes:
 - a. Use MSPEXP430FR5969 as hardware platform and demonstrate the low power modes and measure the active mode and standby mode current.
3. Interrupt programming examples through GPIOs
4. PWM generation using Timer on MSP430 GPIO
5. Interfacing potentiometer with MSP430
6. PWM based Speed Control of Motor controlled by potentiometer connected to MSP430 GPIO
7. Using ULP advisor in Code Composer Studio on MSP430
8. Connect the MSP430 to terminal on PC and echo back the data
9. Master Slave Communication between 2 MSP430s using SPI
10. A basic Wi-Fi application –Communication between two MSP430 based sensor nodes
11. Enable Energy Trace and Energy Trace ++ modes in CCS for any of the above [exp. 4-7]
12. Compute Total Energy, and Estimated life time of a battery

Books and other References:

MSP430 Microcontroller Basics by John H. Davis

http://processors.wiki.ti.com/index.php/MSP430_LaunchPad_Low_Power_Mode

http://processors.wiki.ti.com/index.php/MSP430_16-Bit_Ultra-Low_Power_MCU_Training

UNIVERSITY

Kepang



SAPIENCE CONSULTING

Apurva





Sapience
Consulting

ANNEXURE G continued...

REAL TIME SYSTEMS

FOR UG LECTURE: 42hrs

Practical: 14hrs

TOTAL: 56 hrs

Theory:

UNIT-I: Introduction to Real Time System - 8 Hours

Introduction to Real time Embedded System, need for a real-time system, different kinds (reactive, time driven, deadline driven, etc.,) Embedded system Design cycle, Types of Real Time systems, Real Time Applications and features, Issues in real time computing, aspects of real-time systems (timeliness, responsiveness, concurrency, predictability, correctness, robustness, fault tolerance and safety, resource limitations, RTOS necessity), real-time requirement specifications, modelling/verifying design tools (UML, state charts, etc.,).

UNIT-II: Embedded Hardware for Real Time System – 10 hours

Selection criteria for Real time system - Hardware and Software perspective, need for partitioning, criteria for partitioning (performance, criticality, development ease, robustness, fault tolerance and safety, resource limitations, etc.,), System Considerations, Basic development environment-host vs target concept, CPU features, Architecture, I/O Ports, on-chip peripherals, Memory, Real time implementation considerations, bus architecture, Introduction to Interrupts, Interrupt vector table, interrupt programming, Pipeline and Parallelism concepts

Case study of C2000 architecture, Real time applications by interfacing C2000 with sensors and actuators (example: Motor Control, Digital Power, and Power Line Communication)

UNIVERSITY



SAPIENCE CONSULTING





UNIT III: Embedded Hardware – On chip Peripherals and Communication protocols – 08 hours

Role of peripherals for Real time systems, On-Chip peripherals & hardware accelerators, Peripherals [Direct Memory Access, Timers, Analog to Digital Conversion (ADC), DAC, Comparator, Pulse Width Modulation (PWM)], Need of real time Communication, Communication Requirements, Timeliness, Dependability, Design Issues, Overview of Real time communication, Real time Communication Peripherals – I2C, SPI & UART

Case study - Illustration of configuring and interfacing the peripherals (timers, ADC, DAC, and PWM) and Real time communication protocols (I2C, SPI & UART) using C2000 platforms

UNIT IV: Embedded Software and RTOS - 08 hours

Software Architecture of real time System, Introduction to RTOS, role of RTOS, foreground Back ground system, pros and cons, Real time kernel, qualities of good RTOS, Functionalities of RTOS – Task Management, I/O management, Memory management, Inter Task Communication, Tasks, Task states, Task control block, attributes of TCB, Context switching, Interrupts handling, Multiprocessing and multitasking

Case study examples for demonstrating task management functionalities (ex: Task switching, task deleting, task suspending and resuming, managing priority and etc.,) using TI RTOS on C2000 platforms.

UNIT-V Scheduling, Synchronization and Inter task communication in Real Time Systems – 08 Hours

Basic Concepts for Real-Time Task Scheduling, Scheduling criteria, Overview of Scheduling policies, Task Synchronization – Need of synchronization, shared data problems and its ways of handling, Role of Semaphore, types of semaphores, semaphore functions, Inter task communication – Need of communication, Message Mailbox and Message Queues, RTOS problems - Priority inversion phenomenon, Deadlock phenomenon and steps to handle them.

UNIVERSITY

SAPIENCE CONSULTING





Sapience
Consulting

Case study examples to demonstrate concepts of task synchronization (Semaphore) and Inter task communication (Mailbox and Message queues), using TI RTOS for C2000 platforms

Appendix:

- Case study examples to demonstrate the implementation of Real time systems using the MSP430 platform similar to C2000 (including RTOS)
- Study of RTOS based Real Time Applications using C2000: (such as Motor Control, Digital Power, and Power Line Communication).

TEXT BOOKS

1. Real-Time Systems by Jane W. S. Liu Prentice Hall; 1 edition ISBN: 978-0130996510
2. Krishna .C.M "Real Time Systems" Mc-Graw Hill Publication.
3. Hamid A. Toliyat and Steven G. Campbell, "DSP based Electromechanical Motion Control" CRC Press, 2003, ISBN 9780849319181.
4. Jean J Labrosse, "Embedded System Design blocks", CMP books, Second Edition, ISBN 0-87930-604-1
5. John H Davies, "MSP430 Microcontroller Basics" Newnes, 2nd edition, ISBN-13: 978-0750682763

REFERENCES

1. TMS320C28x CPU and Instruction Set Reference Guide, TI Literature Number: SPRU 430E, Revised January 2009
2. TMS320x28xx, 28xxx DSP Peripheral Reference Guide, TI Literature Number: SPRU566J, Revised April 2011
3. C2000 Teaching CD ROM from Texas Instruments
4. Intro to the TI-RTOS Kernel Workshop Lab Manual, by Texas Instruments, Rev 2.3 – December 2014

UNIVERSITY

Kepang



SAPIENCE CONSULTING

Apurva





Sapience
Consulting

5. http://processors.wiki.ti.com/index.php/C2000_32-bit_Real-Time_MCU_Training

Practical Sessions

1. Introduction to the CCS IDE, its features, project options and basic examples
2. Analog-to-Digital Converter Lab: Build a data acquisition system
3. Control Peripherals Lab: Generate and graph a PWM waveform
4. Direct Memory Access (DMA) Lab: Use DMA to buffer ADC results
5. Interface TI C2000 with actuators such as motor control enabling real time capabilities of C2000
6. Program to demonstrate the Task switching Simulation on CCS IDE
7. To demonstrate the blink led application Using Hwi (Hardware Interrupt: periodically to produce an interrupt using Timers) of TI RTOS
8. Program to demonstrate the Blink led application Using a Swi (Software interrupt) of TI RTOS
9. To introduce two time-based SYS/BIOS services – Clock and Timestamp in TI RTOS
10. Program to demonstrate the Task synchronization using Semaphores using TI RTOS
11. Program to demonstrate Inter Task Communication Using of Mailboxes and Queues using TI RTOS
12. Program to demonstrate the Communication Protocols – I2C, SPI and USART using TI RTOS
13. RTOS based complete case study - System Application exercise.

UNIVERSITY

Kepaag



SAPIENCE CONSULTING

Apurna





Visvesvaraya Technological University
"Jnana Sangama", Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

Ref. No: VTU/Aca/2015-16/ 6500

Date: 20 OCT 2015

ANNEXURE E: Letter from BOS

To,
Texas Instruments India University Program
Texas Instruments India,
Bagmane Tech Park, CV Raman Nagar
Bangalore – 560093

Dear Sir,

Sub: Approval of curriculum in Linear Integrated Circuits and Microcontroller for Embedded Systems

Vide reference cited above, it is to confirm that, effective immediately, the University has made changes to the curriculum structure and content for following courses

1. Linear Integrated Circuits Theory (14XX42, IV Semester)
2. Linear Integrated Circuits Lab (14XXL47, IV Semester)
3. Microcontroller for Embedded Systems Theory (14XX44, IV Semester)
4. Microcontroller for Embedded Systems Lab (14XXL48, IV Semester)

The modified course for both theory and lab is enclosed herewith and will be applicable from the academic year 2015-16 for all constituent and affiliated Engineering colleges under Visvesvaraya Technological University, Belagavi.

Enclosures:

Approved course content for (total 11 pages)

1. Linear Integrated Circuits Theory (14XX42, IV Semester)
2. Linear Integrated Circuits Lab (14XXL47, IV Semester)
3. Microcontroller for Embedded Systems Theory (14XX44, IV Semester)
4. Microcontroller for Embedded Systems Lab (14XXL48, IV Semester)

Regards,

BOS CHAIRMAN
Visvesvaraya Technological University

REGISTRAR
Visvesvaraya Technological University

REGISTRAR
Visvesvaraya Technological University
Belagavi



Visvesvaraya Technological University

“Jnana Sangama”, Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

ANNEXURE G: Approved Curriculum by BOS, VTU

Linear Integrated Circuits			
SEMESTER – IV			
Subject Code	14XX42	IA Marks	
Number of Lecture hours/Week	04	Exam marks	
Total number of lecture hours		Exam Hours	
CREDITS - 04			
Course Objectives: The course objective is to make student of core engineering branches is to understand the following: <ol style="list-style-type: none">1. Basic concepts of op-AMPs characteristics and specifications2. Op-AMP applications to signal conditioning for amplifiers, filters and oscillators3. Op-AMP applications for comparators and data conversions4. Op-AMP for advanced applications such as PLL, VCOs, V-I converters, I-V converters, AGC,AVC, analog multipliers			
Module -1			Teaching hours
Introduction to Operational Amplifiers and Characteristics Introduction, Block diagram, characteristics and equivalent circuits of an ideal op-amp, various types of Operational Amplifiers and their applications, Power supply configurations for OP-AMP applications, inverting and non-inverting amplifier configurations			6-7 hrs
Module -2			
The Practical op-amp Introduction, Input offset voltage, offset current, thermal drift, Effect of variation in power supply voltage, common-mode rejection ratio, Slew rate and its Effect, PSRR and gain – bandwidth product, frequency limitations and compensations, transient response, interpretation of Op-Amp (LM741/ TL082) datasheet.			7-8 hrs
Module -3			
Amplifiers and Oscillators Summing amplifier, Integrators and differentiators, Instrumentation amplifier, Differential input and differential output amplifier, Voltage-series feedback amplifier, Voltage-shunt feedback amplifier, Log/ Antilog amplifier, isolation amplifiers, Triangular/rectangular wave generator, phase-shift oscillators, Wein			7-8 hrs

BOS CHAIRMAN

REGISTRAR

REGISTRAR

Visvesvaraya Technological University
Belagavi



Visvesvaraya Technological University

“Jnana Sangama”, Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468

Fax : (0831) 2405467

bridge oscillator, analog multiplier (MPY634) VCO	
Module -4	
Active Filters Characteristics of filters, Classification of filters, Magnitude and frequency response, Butter worth 1 st and 2 nd order Low pass, High pass and band pass filters, Chebyshev filter characteristics, Band reject filters, notch filter, All pass filters, self-tuned filters	7-8 hrs
Module -5	
Comparators and Converters: Comparator, Zero Crossing Detector, Monostable and Astable Multivibrator, Schmitt Trigger, Voltage limiters, Clipper and clampers, Absolute value output circuit, Peak detector, Sample and hold Circuit, Precision rectifiers, Voltage-to-current converter, Current-to-voltage converter.	6-7 hrs
Module-6	
Advanced applications Applications as Frequency Divider, PLL, AGC,AVC using op-AMP and analog multipliers, Amplitude modulation using analog multiplier, Frequency Shift Keying, simple OP-AMP Voltage regulator, Fixed and Adjustable Voltage Regulators, Dual Power supply, Basic Switching Regulator and characteristics of standard regulator ICs – TPS40200, TPS40210	7-8 hrs.
Course Outcomes: 1. Students will be able to learn about the operational amplifiers and its characteristics as well as various types of op-amps. 2. Students will acquire the ability to design and test practical circuits for amplifiers, filters and oscillators. 3. Students will be able to analyze the operation of comparators, data convertors and implementation of the same. 4. Students will be able to learn the functioning of PLL, VCO, V-I, I-V converters, AGC, AVC and analog multipliers and implement them for suitable applications	
References: 1. Data Sheet: http://www.ti.com/lit/ds/symlink/tl082.pdf 2. Application Note: http://www.ti.com/lit/an/sloa020a/sloa020a.pdf 3. MPY634 Data Sheet: http://www.ti.com/lit/ds/symlink/mpy634.pdf 4. Application Note: http://www.ti.com/lit/an/sbfa006/sbfa006.pdf 5. ASLK Pro Manual: ASLK Manual	

BOS CHAIRMAN

REGISTRAR

REGISTRAR
Visvesvaraya Technological University
BELAGAVI



Visvesvaraya Technological University

“Jnana Sangama”, Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

Linear Integrated Circuits Lab			
SEMESTER – IV			
Subject Code	14XXL47	IA Marks	

1. Study the characteristics of negative feedback amplifier

Aim:

Design the following amplifiers:

- a) A unity gain amplifier
- b) A non-inverting amplifier with a gain of 'A'
- c) An inverting amplifier with a gain of 'A'

Apply a square wave of fixed amplitude and study the effect of slew rate on the three type of amplifiers.

Applications:

- Amplifying bioelectric potentials (ECG, EEG, EMG, EOG) and piezoelectric with high output impedance.
- Amplifying sensor output signals (temperature sensors, humidity sensors, pressure sensors etc.)

Sample questions

Explain the need for unity gain amplifier.

Advantages of op-amp based amplifiers as compare to BJT amplifiers.

Mention the applications for inverting and non-inverting amplifiers.

Give your inference on the frequency response of the amplifier.

Give the significance of gain-bandwidth product.

2. Design of an instrumentation amplifier

Aim:

Design an instrumentation amplifier of a differential mode gain of 'A' using three amplifiers.

Applications:

- Used in measuring instruments designed for achieving high accuracy and high stability.
- Used for amplifying low voltage, low frequency and higher output impedance signals.

Sample questions

BOS CHAIRMAN _____

REGISTRAR _____

REGISTRAR
Visvesvaraya Technological University



Visvesvaraya Technological University

“Jnana Sangama”, Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

Explain the need for two stages in any instrumentation amplifier.
Why CMRR is high for instrumentation amplifiers?
Give some examples for low voltage, low frequency and higher output impedance signals.
How does the tolerances of resistors affect the gain of the instrumentation amplifier?

3. Study the characteristics of regenerative feedback system with extension to design an astable multivibrator

Aim:

Design and test an astable multivibrator for a given frequency.

Applications

- It can be used in signal generators and generation of timing signals.
- It can be used in code generators and trigger circuits.

Sample question

Discuss the difference between astable and bi-stable multivibrator.
Discuss the frequency limitation of astable multivibrator.
Discuss the various applications of bi-stable multivibrator.

4. Study the characteristics of integrator circuit

Aim:

Design and test the integrator for a given time constant.

Applications

- Used in function generators, PI/PID controllers.
- Used in analog computers, analog-to-digital converters and wave-shaping circuits.
- Used as a charge amplifier.

Sample questions

Compare the output with that of ideal integrator.
How will you design a differentiator and mention its drawback.
Discuss the limitation of the output voltage of the integrator.
How will you obtain drift compensation in an inverting integrator?

5. Design of Analog filters – I

Aim:

BOS CHAIRMAN

REGISTRAR

REGISTRAR



Visvesvaraya Technological University

“Jnana Sangama”, Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

Design a second order butterworth band-pass filter for the given higher and lower cut-off frequencies.

Applications:

- Used in signal conditioning circuits for processing audio signals.
- Used in measuring instruments.
- Used in radio receivers.

Sample questions

Discuss the effect of order of the filter on frequency response.

How will you vary Q factor of the frequency response.

Discuss the need for going to Sallen Key circuit.

Compare the performance of Butterworth filter with that of Chebyshev filter.

6. Design of Analog filters – II

Aim:

Design and test a notch filter to eliminate the 50Hz power line frequency.

Applications

- Used for removing power supply interference.
- Used for removing spur in RF signals.

Sample questions

Explain the effect of supply frequency interference while amplifying sensor signals.

Suggest a method for adjusting the Q factor of the frequency response of notch filter.

What is the purpose of going for Twin T notch filter circuit?

7. Design of a self-tuned Filter

Aim: Design and test a high-Q Band pass self-tuned filter for a given center frequency.

Applications:

- Used in spectrum analyzers

Sample Question:

Discuss the effect of the harmonics when a square wave is applied to the filter

Determine the lock range of the self-tuned filter

8. Design of a function generator

Aim:

BOS CHAIRMAN

REGISTRAR

REGISTRAR
Visvesvaraya Technological University
Belagavi - 590 018



Visvesvaraya Technological University

“Jnana Sangama”, Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

Design and test a function generator that can generate square wave and triangular wave output for a given frequency.

Applications:

- Used in testing, measuring instruments and radio receivers.
- Used for obtaining frequency response of devices and circuits.
- Used for testing and servicing of Electronic equipments.
- Used in Electronic musical instruments.
- Used for obtaining audiograms (Threshold of audibility Vs frequency)

Sample questions

Discuss typical specifications of a general purpose function generator.

How can you obtain reasonably accurate sine wave from triangular wave.

Discuss the reason for higher distortion in sine wave produced by function generators.

What do you mean by Duty cycle and how can you vary the same in a function generator?

9. Design of a Voltage Controlled Oscillator

Aim:

Design and test voltage controlled oscillator for a given specification (voltage range and frequency range).

Applications:

- Used in Phase Lock Loop (PLL) circuits.
- Used in frequency modulation circuits.
- Used in Function generators
- Used in frequency Synthesizers of Communication equipments.

Sample Questions

Discuss the following characteristics of a voltage controlled Oscillator.

- i) Tuning range
- ii) Tuning gain and
- iii) Phase noise

Compare the performances VCO based Harmonic Oscillators and Relaxation Oscillators

What are the various methods adopted in controlling the frequency of oscillation in VCOs

Discuss any one method of obtaining FM demodulation using a VCO.

BOS CHAIRMAN _____

REGISTRAR _____

REGISTRAR
Visvesvaraya Technological University
Belagavi



Visvesvaraya Technological University

“Jnana Sangama”, Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

10. Design of a Phase Locked Loop(PLL)

Aim:

Design and test a PLL to get locked to a given frequency ‘f’. Measure the locking range of the system and also measure the change in phase of the output signal as input frequency is varied within the lock range.

Applications:

- Used in tracking Band pass filter for Angle Modulated signals.
- Used in frequency divider and frequency multiplier circuits.
- Used as Amplifiers for Angle Modulated signals.
- Used in AM and FM Demodulators
- Used in Suppressed Carrier Recovery Circuits

Sample Questions:

Draw the block diagram of a PLL based divider and multiplier and explain the functions performed by each block.

Distinguish between Lock range and Capture Range, Explain the method of estimating the same for a given PLL circuit.

Discuss the differences between Analog Phase Lock Loop and Digital Phase Lock Loop.

11. Automatic Gain Control (AGC) Automatic Volume Control (AVC)

Aim:

Design and test an AGC system for a given peak amplitude of sine-wave output.

Applications

- Used in AM Receivers
- Used as Voice Operated Gain Adjusting Device (VOGAD) in Radio Transmitters
- Used in Telephone speech Recorders
- Used in Radar Systems

Sample Questions

Explain clearly the need for AGC in AM Receivers.

Draw the block diagram of feedback and feed forward AGC systems and explain the functions of each block.

Discuss any one gain control mechanism present in biological systems.

BOS CHAIRMAN _____

REGISTRAR _____

REGISTRAR
Visvesvaraya Technological University
Belagavi



Visvesvaraya Technological University

“Jnana Sangama”, Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

How can you use AGC in a Received Signal Strength Indicator (RSSI)

12. Design of a low drop out regulator

Aim:

Design and test a Low Dropout regulator using op-amps for a given voltage regulation characteristic and compare the characteristics with TPS7250 IC

Applications:

- Used in Power Supply of all Electronic Instruments and Equipment's
- Used as Reference Power Supply in Comparators
- Used in Emergency Power Supplies
- Used in Current Sources

Sample Questions

Distinguish between Load Regulation and Line Regulation.

Mention some of the other important parameters in selecting a LDO.

What is power supply rejection ratio (PSRR)?

13. DC-DC Converter

Aim:

Design of a switched mode power supply that can provide a regulated output voltage for a given input range using the TPS40200 IC

Applications:

- Used in DSL/Cable Modems
- Used in Distributed Power Systems

Sample Questions

Discuss the effect of varying the input voltage for a fixed regulated output voltage over the duty cycle of PWM.

Note: The above experiments can be conducted using TL 082/ MPY634/ ASLK Pro Kit/LM741

BOS CHAIRMAN _____

REGISTRAR _____

Visvesvaraya Technological University
Belagavi



Visvesvaraya Technological University

"Jnana Sangama", Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468

Fax : (0831) 2405467

ANNEXURE G continued...

Microcontroller for Embedded Systems			
SEMESTER - IV			
Subject Code	14XX44	IA Marks	
Number of Lecture hours/Week	03	Exam marks	
Total number of lecture hours		Exam Hours	
CREDITS - 03			
Course Objectives: The course objective is to make student of core engineering branches is to understand the following: Understand basic architecture of 16-bit microcontrollers Understand hardware-interfacing concepts to connect digital as well as analog sensors while ensuring low power considerations. Reviews and implement the protocols used by microcontroller to communicate with external sensors and actuators in real world. Understanding Embedded Networking concepts based upon connected MCUs.			
Module -1			Teaching hours
Fundamentals of microcontrollers for Embedded Systems Embedded system overview, applications, features and architecture considerations - ROM, RAM, timers, data and address bus, I/O interfacing concepts, and memory mapped I/O. CISC Vs RISC design philosophy, Von-Neumann Vs Harvard architecture. MSP430x5x series block diagram, address space, on-chip peripherals (analog and digital), and Register sets. Instruction set, instruction formats, and various addressing modes of 16-bit microcontroller; MSP430 specifics. Variants of the MSP430 family viz. MSP430x2x, MSP430x4x, MSP430x5x and their targeted applications, Sample embedded system on MSP430 microcontroller.			8 hrs
Module -2			
Peripherals and programming for Microcontroller Memory Mapped Peripherals, programming System registers, I/O pin multiplexing, pull up/down registers, GPIO control. Interrupts and interrupt programming. Watchdog timer. system clocks. Low Power aspects of MSP430: low power modes, Active vs Standby current consumption, FRAM vs Flash for low power & reliability. Case Study: MSP430 based embedded system application bringing up the salient features of GPIO, Watchdog timer, low power, FRAM.			10 hrs

BOS CHAIRMAN

REGISTRAR



Visvesvaraya Technological University

“Jnana Sangama”, Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

Energy and power consumption estimation for embedded board	
Module -3	
Timers, PWM and Mixed Signals Peripherals Timer & Real Time Clock (RTC), PWM control, timing generation and measurements. Analog interfacing and data acquisition: ADC and Comparator in MSP430, data transfer using DMA. Power considerations: Programming for optimal power consumption while using peripherals, Using MSP430 peripheral intelligence in power management Case Study: MSP430 based embedded system application using ADC & PWM demonstrating peripheral intelligence. “Remote Controller of Air Conditioner Using MSP430”	8 hrs
Module -4	
Communication and other external peripherals Serial communication basics, Synchronous/Asynchronous interfaces (like UART, USB, SPI, and I2C). UART protocol, I2C protocol, SPI protocol. Implementing and programming UART, I2C, SPI interface using MSP430, Interfacing external devices. Case Study: MSP430 based embedded system application using the interface protocols for communication with external devices: “A Low-Power Battery less Wireless Temperature and Humidity Sensor with Passive Low Frequency RFID”	8 hrs
Module -5	
Embedded Networking and Internet of Things IoT overview and architecture, Overview of wireless sensor networks and design examples. Various wireless connectivity: NFC, ZigBee, Bluetooth, Bluetooth Low Energy, Wi-Fi. Adding Wi-Fi capability to the Microcontroller, Embedded Wi-Fi, User APIs for Wireless and Networking applications, Building IoT applications using CC3100 user API for connecting sensors. Case Study: MSP430 based Embedded Networking Application: “Implementing Wi-Fi Connectivity in a Smart Electric Meter”	6 hrs.
Course Outcomes:	
<ol style="list-style-type: none">5. Students will be able to learn 16-bit architecture and its programming.6. Students will acquire the ability to design software using C for embedded systems applications.7. Students will be able to understand and program various digital and analog Sensor Interfaces specific to Microcontroller.8. Students will be able to design and understand various use cases and projects in the domain of Embedded Systems, Internet of Things, and will be able to implement the same.	

BOS CHAIRMAN

REGISTRAR



Visvesvaraya Technological University
"Jnana Sangama", Belagavi - 590 018, Karnataka State

Dr. K. E. Prakash,
Registrar

Phone : (0831) 2405468
Fax : (0831) 2405467

References: MSP430 Microcontroller Basics by John H. Davis http://processors.wiki.ti.com/index.php/MSP430_LaunchPad_Low_Power_Mode http://processors.wiki.ti.com/index.php/MSP430_16-Bit_Ultra-Low_Power_MCU_Training	
--	--

Microcontroller for Embedded Systems Lab SEMESTER – IV			
Subject Code	14XXL48	IA Marks	

1. Interfacing and programming GPIO ports in C using MSP430 (blinking LEDs , push buttons)
2. Usage of Low Power Modes:
Use MSPEXP430FR5969 as hardware platform and demonstrate the low power modes and measure the active mode and standby mode current.
3. Interrupt programming examples through GPIOs
4. PWM generation using Timer on MSP430 GPIO
5. Interfacing potentiometer with MSP430
6. PWM based Speed Control of Motor controlled by potentiometer connected to MSP430 GPIO
7. Plot the power envelope in an application.
8. Using ULP advisor in Code Composer Studio on MSP430
9. Connect the MSP430 to terminal on PC and echo back the data
10. Master Slave Communication between 2 MSP430s using SPI
11. A basic Wi-Fi application – Communication between two MSP430 based sensor nodes
12. Enable Energy Trace and Energy Trace ++ modes in CCS for any of the above [exp. 4-7]
13. Compute Total Energy, and Estimated life time of a battery

Note: The above experiments can be conducted using MSP 430 IC/ MSP 430 Launch pad

BOS CHAIRMAN

REGISTRAR

Visvesvaraya Technological University
Belagavi

Memorandum of Understanding (MoU)

Between



**Deshpande
Foundation**

&



Visvesvaraya Technological University (VTU)

To Develop

**VTU-Sandbox Startups Centre for Technological Innovation and
Entrepreneurship**

Deshpande Foundation ("DF") a registered Charitable trust established on 29 October 2007, located in Hubli District, Karnataka state, INDIA, sub registered by the Government of Karnataka, Bangalore.

And

Visvesvaraya Technological University (VTU), a Collegiate public state university in Karnataka State, India, established on 1 April 1998 by the Government of Karnataka as per VTU Act 1994

have executed this Memorandum of Understanding on Saturday, 27th September, 2014 for the purpose of promoting mutual understanding and enhancing the development of long-term, comprehensive and professional cooperation between VTU and DF.

Through professional interactions, on the basis of a peer-to-peer relationship and mutual benefit, the Parties hereby enter into this MOU to establish a strategic partnership in several areas outlined below.

1 Preamble & Objectives

Deshpande Foundation is the leading global non-profit organisation operates to create an effective ecosystem where resources are put to use through entrepreneurship, innovation and sustainability. The Deshpande Centre established at Massachusetts Institute of Technology (MIT) has helped spur the creation of 28 spinout companies, which have raised over \$400 million in capital in outside financing. The centre has funded more than 90 projects with over \$11 million grant. Established in 2008, Deshpande Foundation India has developed a holistic entrepreneurial ecosystem – ‘the Hubli Sandbox’ - involving academia, financial institutions, policymakers, experienced mentors, network of resourceful people, early adopters for innovative products, government, policymakers and successful entrepreneurs. To date, it has helped over 50 entrepreneurs to create scalable ventures. In other initiatives like LEaders Accelerating Development (LEAD) program, more than 21,000 students from 75+ colleges contributed for implementation of over 5300 projects in 20 districts, 4 states of South India. Through such programs, we strive to launch effective, relevant and scalable solutions through the investment in enterprises to create positive change in the world. We have already reached and improved lives of over one million families in one or other ways. We are **building an ecosystem that nurtures innovation and entrepreneurship globally.**

Visvesvaraya Technological University (VTU), named after Bharat Ratna Sir. M. Visvesvaraya is an institution that is rich in history, academic excellence, and leadership. VTU is one of India’s leading and largest technical Universities having 201 affiliated engineering colleges and several PG programs. Every year VTU graduates over 79,000 students who are the next generation technical leaders, thinkers, innovators and scholars towards meeting this objective.

VTU and DF come together with the common objective to promote innovation and entrepreneurship, channelizing technological innovation, providing mentorship and network to promote culture of entrepreneurship among current students and alumni (“students”). Through VTU-Sandbox Startups Centre (“**Incubation Centre**”) for Technological Innovation and Entrepreneurship both parties will work together to elicit growth of student entrepreneurs. By 2025, this centre will expose 100,000 students to innovation and entrepreneurship through its programs, invite 5000+ ideas and incubate 500 start-ups which will create 5000 engineering jobs and contributing 100 crore of additional revenue to Karnataka state’s economy. This centre will also connect at least additional 1000 aspiring students to new start-ups for employment opportunities. The faculty would also benefit from these programs and initiatives as it would enhance their involvement in entrepreneurial activities. This will help faculty members to colligate existing teaching-learning process to value creation.

The DF programs are the touchstones for social incubators and have been creating significant impact in society. DF initiatives will hone entrepreneurial acumen in students and thus would enhance students’ opportunities for career progression locally and globally.

2 Mandate of the VTU-Sandbox Startups Centre for Technological Innovation and Entrepreneurship for the Deshpande Foundation (DF) under this MoU

During the term of this MoU, DF may make following contributions to the centre:

2.1 Operationalise the incubation centre

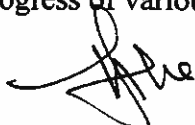
- 2.1.1 Assist VTU during initial setting up process of VTU-Sandbox Startups Centre and support VTU for recruiting, training and deploying coordinator(s) to manage the incubation centre.
- 2.1.2 Set up a **Knowledge Depository** which will include necessary reading materials, case studies, templates and reports related to Business plan writing, Marketing, Fundraising, Finance and subjects related to innovation and entrepreneurship.
- 2.1.3 Provide necessary IT infrastructure support to start-ups incubated in incubation centre.
- 2.1.4 Assist VTU to implement Student Entrepreneurship policy and manage certification processes mandatory under Student Entrepreneurship policy for student led enterprises.

2.2 Supporting student led enterprises and start-ups incubated in incubation centre

- 2.2.1 Set up selection process for student entrepreneurs. Student entrepreneurs shall prepare and present business plan to Deshpande Foundation incubation team. The student entrepreneur shall go through rigorous due diligence and feasibility analysis process recognised by the Deshpande Foundation incubation team. Selected student entrepreneurs shall be supported by incubation centre.
- 2.2.2 Assist start-ups by providing opportunities for securing financial support. DF will coordinate with start-ups for accountability of utilising funds, and
- 2.2.3 Determine growth criteria and reporting frequency to measure performance of start-ups. DF will determine exit strategy depending on performance and/or agreement.

2.3 Entrepreneurship cell (e-cell) development

- 2.3.1 Coordinate with the VTU to develop e-cells in its selected affiliated colleges, research and PG centres.
- 2.3.2 Provide assistance to VTU, its selected affiliated colleges, research and PG centres to operationalise the e-cell, select and train the e-cell coordinator to facilitate e-cell operations. The e-cell coordinator shall be responsible to execute programs and activities as directed/initiated by VTU-Sandbox Startups Centre. The e-cell coordinator shall report the VTU-Sandbox Startups Centre for the progress of various initiatives running in e-cells.



2.4 Mentorship and Network development

- 2.4.1 Provide support in product & technology mentoring, Go-To-Market strategies, financial planning, including helping the start-ups get access to DF programs for product feedback, marketing and technical guidance, connection to early adopters through its network.
- 2.4.2 Support student entrepreneurs by providing feedback and ongoing mentorship at every stage as needed.

2.5 B-Plan competitions

- 2.5.1 Organise Business Plan (B-plan) competition for the VTU, its affiliated colleges, research and PG programs in coordination with e-cells.
- 2.5.2 Selected B-plans shall be incubated in VTU-Sandbox Startups Centre for further development and support.

2.6 Other activities

- 2.6.1 Conduct seminars, guest lectures, webinars and events to stimulate entrepreneurial activities in VTU, its affiliated colleges, research and PG centres.
- 2.6.2 Support the VTU, its affiliated colleges, research and PG centres for organising events coordinated by e-cell within respective premises.

3 Mandate of the VTU-Sandbox Startups Centre for Technological Innovation and Entrepreneurship for *the Visvesvaraya Technological University (VTU)* under this MoU

During the term of this MoU, VTU may make following contributions to the incubation centre:

3.1 Providing necessary infrastructure

- 3.1.1 Ensure that necessary investments are made to run the Incubation centre. VTU will closely work with DF to design incubation centre.
- 3.1.2 Appoint a full-time coordinator who will assist DF team to manage the incubation centre and coordinate with VTU and its affiliated colleges, research and PG centres.
- 3.1.3 Appoint an additional fulltime coordinator, if required, to ensure smooth operations of the incubation centre.



3.1.4 Provide following infrastructure to setup VTU-Sandbox Startups Centre for Technological Innovation and Entrepreneurship:

- i. 2500 sq.ft. space comprise of Administration area, Incubation space for start-up companies, Seminar/meeting room
- ii. Necessary furniture, lighting and cooling arrangements
- iii. Drinking water facility
- iv. Electricity and backup arrangement in case of mains failure
- v. Independent washrooms and toilet for male and female
- vi. Accommodation facility for students entrepreneurs in residential programs
- vii. Security measures for VTU-Sandbox Startups Centre, and
- viii. Other existing facilities like Guest house.

3.1.5 Provide following IT infrastructure to setup VTU-Sandbox Startups Centre for Technological Innovation and Entrepreneurship.

- i. Stage 1: 20 computers (Desktops/Laptops)
Stage 2: 20 computers (Desktops/Laptops)
- ii. Projectors: 2 no.
- iii. Necessary support services in case of machine failure
- iv. 5.0 MBPS dedicated internet connection, and
- v. Security measures to protect hardware and other equipments.

3.1.6 Intimate and send information about the processes under the VTU-Sandbox Startups Centre covered under this MOU as required.

4 Joint contributions by DF and VTU

- 4.1 DF and VTU will jointly mobilize the funds for VTU-Sandbox Startups Centre and it will be utilized for the objective of the MOU
- 4.2 The DF and VTU shall jointly promote the object of the MOU, through the standard print orders and materials for circulation of policy document in the VTU, its affiliated colleges, research and PG centres, and
- 4.3 DF and VTU will jointly do a press conference to announce the partnership.



5 Terms and Termination

- 5.1 This MoU is valid for a period of three (3) years from the date of signing of this MoU and is renewed subsequently by mutual consent for additional 3 year terms
- 5.2 The terms of this Agreement shall commence as set-forth above and remain in effect until
- 5.2.1 Either party communicates to terminate this Agreement or Otherwise superseded by another
- 5.2.2 Both parties agree to give the other 90 days written notice of their intent to terminate this Agreement
- 5.2.3 Upon termination of this Agreement, any VTU student entrepreneur who is selected for incubation will be authorised to communicate and continue taking further support from both parties if needed, and
- 5.2.4 Any changes to the MoU are to be mutually agreed to by DF and VTU and duly executed in writing.

This agreement shall become effective from Saturday, 27th September, 2014 upon signing of this MoU.



Dr. H. Maheshappa
Vice-Chancellor
Visvesvaraya Technological University
"JnanaSangama"
Belgaum - 590 018
Karnataka, India.




Naveen Jha
CEO - Deshpande Foundation
Deshpande Centre for Social Entrepreneurship
Building, BVB College of Engineering and
Technology, Vidyanagar, Hubli - 580 031
Karnataka, India.





talentspear

16

37

Memorandum of Understanding

This Memorandum of Understanding (MOU), effective upon the date of execution by the last party to sign is entered into by and between:

Headfirst Softwares Private Limited (TALENTSPEAR - a Unit of Headfirst), a company incorporated under the provisions of the Companies Act, 1956 and having its registered office at Koramangala, Bangalore 560034 and hereinafter unless the context otherwise requires to be referred to as "Talentspear".

And

Visvesvaraya Technological University (having its registered office at Jnana Sangama, Belagavi, Karnataka 590018) and hereinafter, unless the context otherwise requires, be referred to as "VTU"

Whereas:

VTU recognizes the need to skill the youth community of VTU, to enhance their employment potential with systematic training, certificates of competency, and placement assistance and enable them to become effective contributors towards the nation's growth and development.

In an effort to bridge the gap between academia and industry and meet the talent requirement of industry, Talentspear has approached VTU with an offer to provide practical exposure for the VTU's faculty and students studying in academic institutes of VTU and its affiliated institutes to improve the talent availability across various disciplines in diverse industry sectors.

VTU has considered the offer and has decided to partner with Talentspear to recognize and conduct various Industry oriented and Job oriented talent enhancement activities and Internship opportunities.

After mutual discussions in this matter, Talentspear and VTU have ascertained areas of broad consensus and have therefore, agreed to enter in writing the areas of consensus, under this MOU.

For Headfirst Softwares Private Limited

Director

REGISTRAR
Visvesvaraya Technological University,
BELGAUM



talentspear

Now, this agreement witnesses that:

1. Terms & Conditions:

Under this MOU, **VTU** assures **Talentspear** that it will work collaboratively in enabling Talentspear to perform the following:

- (i) Talentspear will make available a trainer to deliver the Workshops to students at each of the four regional centers and constituent colleges (affiliated colleges, wherever necessary) of VTU. Later on for a refresher course including advanced level topics as required, will be delivered on campus or at Talentspear facility.
- (ii) Talentspear intends to make available resource persons at a minimum of once a semester to conduct workshop/conference/seminar with VTU in the lead.
- (iii) Talentspear proposes to facilitate the industry university interaction by connecting with Talentspear's ecosystem of business partners with a vision to build the capability relevant to industry's demand. This will lead to activities such as panel discussions, workshops, guest lectures, hackathons, etc. at central locations such as the regional centres of VTU.
- (iv) Talentspear will provide an opportunity to be interviewed for internship directly, for the students who are declared winners in various hackathons/competitions.
- (v) Talentspear intends to facilitate industrial visit to Talentspear's ecosystem of business partners and allow for interactions with employees who are in research or product development.

It will also be the responsibility of **VTU** to:

- (i) VTU will nominate a Single-point-of-Contact to co-ordinate and engage with Talentspear for the initial enablement of internships & other activities.
- (ii) VTU will ensure that the faculty in their respective colleges will also impart the same support to students either via curriculum or via value-added courses.
- (iii) VTU will ensure that the students are invited & made fully available, for the period of workshops on dates that will be mutually agreed upon.
- (iv) VTU will ensure that at least 50 student projects per college are built during the Term of this MoU on Talentspear's platform.
- (v) VTU will help initiate the process of Internships and Hackathon to be included in the curriculum in UG/PG program as Labs in case it has not been included so far.

For Headfirst Softwares Private Limited

Director

REGISTRAR
Visvesvaraya Technological University
BELGAUM



VTU and Talentspear further agree that,

- (i) Both the parties shall permit their respective experts to contribute in the teaching/training programs conducted by either organization through mutual consent.
- (ii) Both the parties agree to organize the 'Hackathon' at the campuses of VTU and/or its affiliated colleges.
- (iii) Both the parties agree to cooperate in the selection of students for internship and field visits with Talentspear and its ecosystem of business partners.
- (iv) Both the parties shall be free to use the name and logo in promotional literature, website, marketing and advertising material related to the internships, hackathons, workshops, competitions, and faculty-student development training programs or any such activity.
- (v) On completion of the internships, hackathons, workshops, competitions, and faculty-student development training programs or any such activity a certificate will be issued with logo, name and signature of both the parties on the certificate.

2. a) Training

Talentspear intends to conduct faculty development programs and student development programs on select technologies, skills and services. The faculties who have undergone Talentspear's faculty development program and who are mentoring at least 5 student projects each will be regarded as "Talentspear Mentor". They would then need to train students on their area of expertise relevant for the projects.

b) Internship and Entrepreneurship:

Talentspear intends to provide internship opportunities to students studying under VTU in different disciplines/branches. Talentspear would also provide the projects from its ecosystem of business partners as internship projects to students, where these students would be working on real-world problems and their solutions in these live projects, which could eventually become products in the industry and may be used by several people.

The internship opportunity provided by Talentspear is primarily a student-focused learning experience, where they will understand the practical applications of the theory they have studied in the university course. The internships are provided with the objective to prepare students on latest industry concepts & tools to become globally competitive. With the practical exposure they gain during internship, will enable them to get a job easily or pack them with confidence to become entrepreneurs and start their own enterprise even before they conclude their final semester. Talentspear will help them, mentor them at every stage by setting up incubation centers at VTU's Campuses, Regional Centers and its affiliated-constituent colleges and provide incubation services.

c) Hackathon:

Hackathon is a coding contest where students learn and implement (programming, coding, designing, assembling, and prototyping) for a specified time such as 12-24-36 hours on a given theme. Through Hackathons, Talentspear intends to equip engineering graduates with the practical knowledge on latest tools & trends of industry and necessary soft skills to easily secure job placements. Talentspear agrees to work with VTU and its constituent and

For Headfirst Softwares Private Limited

Director

REGISTRAR
Visvesvaraya Technological University
BELGAUM



affiliate colleges to launch new type of hackathons, competitions and courses on latest industry trends for students of all engineering and related disciplines.

Hackathon focuses on Immersive & Experiential Learning through real time experience of implementing. During the event students will also be enlightened by technical talks from professionals, experts and mentors about emerging technologies, Industry trends and entrepreneurial journey. Hackathon also provides hiring/recruitment opportunities.

d) Mission: Connect VTU

Students are in need of a platform to express their interests, expertise and to seek help in improvising their personality, studies, project work, recruitment & placements and many such activities. Talentspear through the "Mission: Connect VTU" wants to take up this mammoth task to build an online platform, where each and every student will have his own personal webpage and an opportunity to network with likeminded students. Every student will have the option to modify and update their respective webpages and share their respective links with anyone they find relevant to get their detailed information on the click of a button on internet.

Under this mission, Talentspear shall have the complete responsibility towards developing webpages for every student studying at VTU. Talentspear shall own and maintain the web domain and all the rights related to the website, web server, database servers, student web pages and content will lie with Talentspear.

VTU shall support this mission by providing complete student details in softcopy (preferably MS Excel or APIs) which includes student name, USN number, year and course of enrollment, college and personal contact details, phone and email of the student and all other student details which may be required to develop individual webpages for the students.

e) Application Programming Interface (API):

Talentspear offers to build a set of APIs for VTU's student database. These APIs will allow the third-party applications to access and validate student's information stored in databases at VTU in a highly secured manner. It will be similar to the APIs exposed by Government of India for 'Aadhaar' application to fetch & validate candidate's details.

After VTU incorporates these APIs, then VTU will be the first University to offer background verification services. VTU can further offer these API services as paid service. As Talentspear will be developing these API for VTU, VTU agrees to offer these services to Talentspear free of cost, perpetually.

3. Intellectual Property:

Except for the permitted use of Confidential Information, each party acknowledges that, under this MOU, a party acquires neither any intellectual or other property, including without limitation copyright, trademark, business or trade secrets, methodologies, professional techniques, works of authorship, training material, courseware or content ("IP") from the other party and nor any right in IP from the other party.

4. Liabilities:

Neither party is liable for the intentional or negligent acts or omissions of the other. Each party shall be responsible for its intentional or negligent acts or omissions and those of its officers, employees, agents, contractors, or students (if applicable), howsoever caused, to the extent allowed by applicable law.

5. Dispute Resolution:

Both the parties shall refer any dispute arising under or in connection with this MOU, which cannot be resolved by amicable discussions to the Vice Chancellor, VTU and the Director of Talentspear, whose decision will be final and not be subject to any appeal.

For Headfirst Softwares Private Limited

Director

REGISTRAR
Visvesvaraya Technological University
BELGAUM



6. Modification:

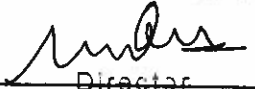
Modifications to this MOU shall be made by mutual consent of the parties through the issuance of a written modification, signed and dated by authorized representatives of each party, prior to any changes being performed.

7. Termination:

- (i) This MOU will be effective from the date of signing.
- (ii) The duration of MOU shall be a period of 5 years from signing date.
- (iii) The MOU may be terminated by prior notice of not less than three months by either party.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the written date below.

Headfirst Software Private Limited



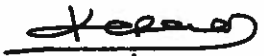
Director

Headfirst Software Private Limited
(TALENTSPEAR - a Unit of Headfirst)

Name: Mr. Sateesh Havannavar

Title : Director

Date : 12/01/2016



REGISTRAR

Vivekananda Technological University
(VTU, Belagavi)

Name: Dr. K.E. Prakash

Title : Registrar

Date : 12 JAN 2016



ANNEXURE I



APIUniversity™ Platform *(Version 1.0)*
(Part of MOU between Talentspear and VTU)





INDEX

1 Introduction

2 Objective

3 Goals

4 Solution

4.1 API Software Stack

4.2 RESTful Services

4.3 Security

4.4 Data Format

5 Project Outline

5.1.1 Hardware

5.1.2 Software

5.2 Milestones and Reporting

5.2.1 Analysis

5.2.2 Development

5.2.4 Deployment

5.2.5 Training and Documentation

5.4. Warranty

5.5. Support

5.6. Pricing and Payment

6 Disclosure, Clauses and Licensing



1 Introduction

In continuation of MOU signed between VTU and Talentspear (Unit of Headfirst Softwares Private Limited). API Platforms are one of the standard and secure ways to provide easy Access and Dissemination of academic data. This allows for Student, Academia and Industry participants to securely share/access data and build interesting applications and drive innovations.

Talentspear will build an API, APIUniversity - a complete software developed over VTU data, which VTU would like to access to Talentspear for lifetime.

Detailed Technical and Non-Technical documents will be submitted after the requirement analysis at VTU.

Target Audience

The APIUniversity™ Platform is designed to serve several audiences:

- Client, Server, or Middleware vendors interested in building software for VTU.
- Application developers who need to "VTU-enable" their applications.
- Service Providers who need to implement specific authentication protocols. For example; A security company can use the APIUniversity™ Platform to implement a Third Party Background Verification that allows concerned parties to verify the 'Credentials' of VTU Students.

Acknowledgments

The authors of this specification are Mr. Sachin Shekhar R and Mr. Sateesh Havannavar from Talentspear.

We would like to acknowledge the following VTU representatives for their comments and feedback on the initial drafts of this document:

- Dr. H. Maheshappa, Vice Chancellor, VTU
- Dr. K.E.Prakash, Registrar, VTU
- Mr. Nayaz Ahmed, Fellow, VTU



2 Objective

A primary objective of this proposal is to establish a 'secure' digital access to student, college and University data(hereafter called 'VTU data') based on API standards principle.

1. Provide VTU data for access to enable industry , academia and students to securely share/access data and build interesting applications and drive innovations.
2. Provide interaction platform tools to learners and act as a facilitator between industry experts, academia, university administrators and the students.
3. Supplement the conventional system of data sharing and bring uniformity in data made available to students overcome distance barrier and regional imbalances.
4. Explore the possibility of using the platform for administrative purposes and other activities of the VTU

3 Goals

A primary goal of this proposal is to establish a platform for allowing VTU to share VTU data and involving industry, academia and students to build/share products and service APIs ("web services" herein).

Such a platform will enable

- VTU to perform data analytics on VTU data based on best practices
- Academia to reach out and analyse VTU data.
- Organizations/Employment providers to authenticate VTU data for background verification.
- Software vendors to build awesome software for VTU data.
- Training and Skill development providers to tailor their offerings to students across various demographics



4 Solution

Talentspear will build VTU APIUniversity™ - a complete API platform over data which VTU would like to share with students, academia and industry. The solution will follow a strict adherence to using API Source Software and deliver a Secure RESTful API in a cleanly documented data format.

4.1 API Software Stack

All software tools and libraries used will be from open source to avoid lock in with any third party vendor software licenses.

4.2 RESTful Services

1. APIs to a APIUniversity™ product or service should be primarily RESTful.
2. Briefly, this means that the API should be designed around identifiable resources which can be manipulated by a small handful of predefined actions (creation, modification, deletion).

4.3 Security

1. Services **MUST** require the use of HTTPS for RESTful API traffic. Services **MUST NOT** redirect non-secure HTTP requests to their secure HTTPS equivalents, but instead should result in a hard failure.
2. Services **MUST NOT** use wildcard or self-signed certificates when deployed in production.
3. Services **MUST** use certificates issued by widely trusted certificate authorities, exclusively, when deployed in production.



4.4 Data Access and Data Format

VTU to provide data access to Talentspear team for data analysis, development and testing the API. Structured data resources MUST support retrieval based on JSON representations. The media type to be used in HTTP requests and responses which contain entity data in JSON format MUST be application/json, and optionally qualified with a charset=UTF-8 parameter.

○ 5 Project Outline

5.1.1 Hardware

VTU to provide hardware for development, testing and production.

1. Development server needs to be minimum 4GB RAM and i5 intel CPU's and 50GB hard disk.
2. Production server needs to be provisioned with higher capacity after initial project study from talentspear team.
3. VTU should provide Staging server with minimum 4GB RAM and i5 intel CPU's and 50GB hard disk to test the API code

○ 5.1.2 Software

Talentspear team will use open source software stack for building the platform.

1. Python, AngularJS will be our choice of software for development stack.
2. Ubuntu will be the choice of OS
3. Apache will be choice of Http Server
4. SSL certificates need to be provided by VTU
5. Domain / Sub Domain needs to be provisioned by VTU
6. VTU to provide access for related softwares, which are already present at VTU.



5.2 Milestones and Reporting

5.2.1 Analysis

1. Talentspear will analyse the database and access controls for VTU data before preparing project plan and estimating the development effort.
2. Talentspear will provide technical and non technical documents after the data analysis.

5.2.2 Development

1. Talentspear platform development team will begin work after the effort estimates are accepted.
2. The development will follow an agile process with sprint marked deliveries providing a mechanism for reporting and project status updates.
3. Based on the scope of the accepted work the deliveries will be provided over several milestones.
4. The milestone planning will be taken up after initial project plan.

5.2.3 Testing

Basic test cases will be documented and executed throughout development phases. A final round of testing before acceptance will be carried out before deployment.

5.2.4 Deployment

Deployment of the platform will be the responsibility of VTU, Domain, SSL and other access will be very specific to the VTU network and infrastructure team. VTU should bear API hosting server and Certification cost.



5.2.5 Training and Documentation

1. A walk through of the project will be provided once to VTU personnel on development of the API platform
2. Use cases will be documented by Talentspear team.

5.4. Warranty

The platform is provided as-is for licensed use by VTU only.

5.5. Support

All support requests will be considered as separate activities and outside the MOU and initial project proposal.

5.6. Pricing and Payment

1. Talentspear is offering the development of the platform as-is for VTU in lieu of being able to use its API services and data for free perpetually.
2. After the initial support any requests for new feature additions, software/API development work and related support will be considered separately at an extra cost.
3. Annual charge for maintenance of servers, certificates and data will be borne by VTU.



6 Disclosure, Clauses and Licensing

Talentspear will be responsible for development of the API software platform and in-lieu of payment VTU will provide the lifetime access to the API and the data serving it without any restriction of usage.

APIUniversity™ will support read only operations and build restful services, only for read operations. This is to ensure the data is not comprised with write/modify/delete operations.

VTU will provide access to the database and available data at data site for talentspear team to do a detailed project study. Talentspear team will suggest the hardware and software requirement to host/deploy APIUniversity™ platform.

VTU will be responsible for providing hardware and software infrastructure required to host/scale the SAAS API platform.

VTU will be responsible for provisioning for support & maintenance of the service and also providing single point of contact at VTU for deployment of API and test the application.

For Headfirst Softwares Private Limited

Director

Headfirst Softwares Private Limited
(TALENTSPEAR - a Unit of Headfirst)

Name: Mr. Sateesh Havannavar

Title : Director

Date : 12 JAN 2016

REGISTRAR

Visvesvaraya Technological University
Visvesvaraya Technological University
(VTU, Belagavi)

Name: Dr. K.E. Prakash

Title : Registrar

Date : 12 JAN 2016



MEMORANDUM OF UNDERSTANDING

BETWEEN



**THE REGISTRAR,
VISVESVARAYA TECHNOLOGICAL UNIVERSITY,
BELAGAVI**

&



**ADVANCED ELECTRONIC SYSTEMS,
BENGALURU**

DATE: 09-02-2016

PLACE: BELAGAVI



MEMORANDUM OF UNDERSTANDING

This MEMORANDUM OF UNDERSTANDING (MOU) is made between

1. **THE REGISTRAR, VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**
an entity of incorporated under the laws of India and having its principal place of activity at BELAGAVI, India represented by its REGISTRAR,
2. **ADVANCED ELECTRONIC SYSTEMS, BENGALURU**, an entity incorporated under the laws of India and having its principal place of business at 143,9th Main Road, Near Laggere Cross and Old Rajagopalnagar Police Station, 3rd Phase, Peenya Industrial Area, Bengaluru, India 560058, Represented by its Partner, Mr.J.KASINATHAN.

WHEREAS

- A. VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** is a specialist in providing value-added, holistic engineering education to students at affordable costs, in conducive academic ambience, leading to Personality development and intellectual growth.
- B. ADVANCED ELECTRONIC SYSTEMS, BENGALURU** is a leader in the field of design, development and manufacture of quality products based on microprocessors and microcontrollers for Educational Institutes and customized solution provider for Industries.

OBJECTIVE

"The objective of this MOU is to:

- Set up a lab which will create awareness on Project based learning .
- To train the students in understanding the functionality of various technologies which are used in electronic industry which are beyond the scope of the curriculum".
- Training the faculty and students in the field of Embedded and VLSI Systems.
- Assist students in Placements.

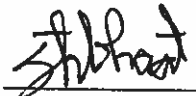
UNIVERSITY



REGISTRAR

Visvesvaraya Technological University 1
BELGAUM

ADVANCED ELECTRONIC SYSTEMS





ADVANCED ELECTRONIC SYSTEMS
143, 9th Main Road, Near Laggere Cross and
Old Rajagopalnagar Police Station, 3rd Phase,
Peenya Industrial Area, Bangalore - 560058.
Telephone: 234-6142/235, 4937443 Mobile: 99014 1111
E-mail: sales@aesindia.com Web: www.aesindia.com
Marketing: 080-7312000, 2347000



- Provide Internship for the students
- Organizing industrial visits for the students

We will co-ordinate with VTU to conduct workshops and seminars for students of UG and PG, faculty and non teaching staff for all colleges affiliated to VTU. Under this we will assist VTU in:

- a. Arranging of Resource Person.
- b. Arranging the boards and Engineers to handle the lab sessions

By signing this MOU VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI and ADVANCED ELECTRONIC SYSTEMS, BENGALURU agree to work jointly in the following areas:

1. **ADVANCED ELECTRONIC SYSTEMS, BENGALURU will set up a Project Lab on VTU, BELAGAVI Campus free of cost. The list of product deliverables is as per Annexure.**
2. **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI, will provide:**
 - a. Space
 - b. Appoint a Co-ordinator for all technical discussions and issues.
 - c. Provide PC's
 - d. Test and measuring Instruments.

BENEFITS:

The above activities will help VTU to develop a R&D centre which will help the students and the faculty to enhance their technical skills and also percolate the knowledge and to build a technically sound eco-system.

Above activities are carried out with mutual acceptance and within the rules and regulations of the participating institutes.

PRICES AND PAYMENTS

By signing this MOU, VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI has no obligation to make any payments to ADVANCED ELECTRONIC SYSTEMS, BENGALURU or vice versa.

UNIVERSITY 
REGISTRAR
Visvesvaraya Technological University 2
BELGAUM

ADVANCED ELECTRONIC SYSTEMS 

ADVANCED ELECTRONIC SYSTEMS
A Unit of the Government of Karnataka
C/O Bangalore Industrial Zone, Bangalore - 560 032.
Tel/Fax: 080-67420000, 080-67420001 Mobile: 9846411171
E-mail: sales@aesys.com Web: www.aesys.com
Marketing: 080-67420002, 20420003, E-mail: sales@aesys.com



However, the Training and Workshop programs are not free of charge. **ADVANCED ELECTRONIC SYSTEMS, BENGALURU** and **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** will mutually decide on the fees to be paid by the candidate at the time of registration for the programs.

TERMS AND CONDITIONS:

- a. If the training/workshop is held at the premises of ALS, then the candidates have to make their own arrangements for food, accommodation and travel.
- b. If the training/workshop is held at the premises of VTU Campus, then VTU will take care of the local hospitality of maximum TWO resource persons deputed from ALS or concerned.
- c. Jointly **ADVANCED ELECTRONIC SYSTEMS, BENGALURU** and **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** will issue certificate to all the candidate at the end of the program.

TERM OF AGREEMENT AND TERMINATION

This MOU shall come into effect from the date of last signature, and shall remain in force for a period of TWO years. The same can be renewed on mutual agreement by both the parties, if required.

Each party shall have the right to terminate this MOU upon 30 days prior written notice if the other party is in breach of any material obligation under this MOU.

MISCELLANEOUS

Any notice given by one party to the other shall be deemed properly given if specifically acknowledged by the receiving party in writing or when delivered to the recipient by hand, registered mail during normal business hours to the following addresses:

UNIVERSITY *Kee...*
 REGISTRAR
 Visvesvaraya Technological University
 BELGAUM 3

ADVANCED ELECTRONIC SYSTEMS *Shilkrant*

ADVANCED ELECTRONIC SYSTEMS
 6th Floor, 1st Cross, 1st Phase,
 New Bellary Industrial Area, Bangalore - 560 042.
 Telephone : 226-642222, 22664222, 22664223
 E-mail : sales@aes.com, www.aes.com
 Marketing : 226-234222, 22623422, E-mail : sales@aes.com



- A. If to **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**, then to
The Registrar:
VISVESVARAYA TECHNOLOGICAL UNIVERSITY,
Jnana Sangam, Belagavi - 590018
Karnataka
- B. If to **ADVANCED ELECTRONIC SYSTEMS**, then to
Mr.Sunil T Shambhatnavar
General Manager
Advanced Electronic Systems,
143,9th Main Road, 3rd Phase
Near Laggere Cross and Old Rajagopalnagar Police Station
Peenya Industrial Area, Bengaluru-560058

IN WITNESS WHEREOF, each of **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** and **ADVANCED ELECTRONIC SYSTEMS, BENGALURU** has caused this MOU to be signed and delivered by its duly authorized representative.

Visvesvaraya Technological University

Advanced Electronic Systems

By:

By:

Name: Dr. K.E. PRAKASH

Name: Mr. Sunil T Shambhatnavar

Title: Registrar

Title: General Manager

Date: 09-02-2016

Date: 09-02-2016

Witness 1

Witness 2

By:

By:

Name: Dr. T C Thanuja

Name: Dr. Shivaprasad B Dandagi

Title: Professor, Dept. of VLSI & ES CPGS, VTU, Belagavi

Title: Dean, Faculty of Engineering, VTU, Belagavi

Date: 09-02-2016

Date: 09-02-2016

UNIVERSITY

ADVANCED ELECTRONIC SYSTEMS

REGISTRAR
Visvesvaraya Technological University, 4
BELGAUM



ADVANCED ELECTRONIC SYSTEMS
143, 9th Main Road, (Near Laggere Cross)
Old Rajagopalnagar Police Station, Peenya Industrial Area, Bengaluru - 560058
Telephone: 080-4142222, 080-2944444
E-mail: info@aes.com Web: www.aes.com
Marketing: 080-2944444, 2944444, 2944444

18

43

MEMORANDUM OF UNDERSTANDING

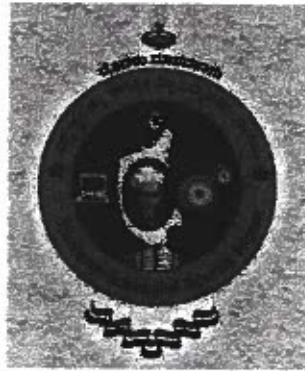
BETWEEN

ASSOCHAM KARNATAKA BANGALORE



AND

VISVESVARAYA TECHNOLOGICAL UNIVERSITY



At

BELAGAVI

ON

EDUCATION AND ADVANCED TRAINING AND EMPLOYMENT

DATED 21ST APRIL 2016

MEMORANDUM OF UNDERSTANDING

This memorandum of Understanding (hereinafter referred to as the "MOU") executed this 21st April 2016 between

VISVESVARAYA TECHNOLOGICAL UNIVERSITY (hereinafter referred as first party) having its office at Jnana Sangama, VTU Main Road, Machhe, Belagavi, Karnataka 590018 and represented by **Sri Dr H G Shekarappa-Vice Chancellor**

and

ASSOCHAM-Karnataka (hereinafter referred as Second Party) having its office at D 13,D Block,First Floor, Brigade MM, 7th Block ,Jayanagar, K R Road ,Bengaluru and represented by its **Karnataka Chairman R Shivakumar**

WHEREAS the VTU BELAGAVI has inter alia as one of its objectives, to provide directly or in collaboration with Industry chambers and other institutions of higher learning facilities including technological and professional education and research in the field of industry and participate in the discovery and transmission of knowledge and the stimulation of intellectual life and skill and cultural development of Karnataka in specific and India in general and to conduct seminars and workshops for the benefit of industry members and also for overseas higher training for the students

WHEREAS ,ASSOCHAM Karnataka has a general aim to contribute to training ,development and Education including technological and professional education and research. Being an apex chamber in India ,it is felt that advanced training needs to be encouraged for sustainable employment under all sections of society.

WHEREAS both institutions desire to establish relations in the area of Skill and labour development, advanced training and other industry related seminars, workshops and knowledge based conclaves on state and national levels

NOW therefore the two parties have agreed to collaborate as follows:-

1. AREAS OF COLLABORATION

To conduct research, teaching, publications and in the area of Education and advanced training and skill and industry related technical and managerial issues

- i) Joint Training arrangements for the promotion of advanced education skill and labour development
- ii) Jointly undertake industry and Education and advanced training and skill oriented projects including publication of research reports on SKILL
- iii) Usage of faculty of the first party for promotion of education employability skill and arrangements for the industrial visits subject to the guidelines prescribed by the curriculum

Operational guidelines both academic and budgetary for each activity under the MOU shall be set down in a specific letter of agreement on case to case basis.

MUTUAL OBLIGATIONS

COLLABORATIVE VENTURES

VTU BELAGAVI and ASSOCHAM-Karnataka agree to enter into collaborative ventures from time to time within the objectives of the Memorandum of Understanding and for the mutual benefit of both parties. Collaborative ventures for all purposes include organising the events, seminars, workshops, training, running skill centres and related to the manufacturing and services sectors.

To promote employability and impart advanced training in education and to arrange for the visits to facilities and faculties in Japan cities.

The commercials such as budgeting and revenue sharing shall discussed and agreed upon through a specific letter of agreement on a case to case basis.

Program Delivery

VTU BELAGAVI as a partner in this MOU with ASSOCHAM-Karnataka shall conduct initially a pilot project to deliver the programs on the following courses:

- a. Soft Skills, Managerial skills, and Professional skills
- b. Entrepreneurship Skills and start ups including advanced training and development.

ASSOCHAM- Karnataka as a partner of VTU BELAGAVI will assist them in arranging the following:

1. Sharing information of Joint initiative to all relevant Institutions, District Chambers, and other stakeholders like Industry members, Government and Students who shall be potential enrollers.
2. Facilitating venue for conducting the program and other logistics in order to initiate the program.
 - a. If ASSOCHAM-Karnataka Regional Council decides, it can lend its own venue without any prejudice of commercials considering VTU BELAGAVI is a foundation by itself which is Non-profit.
3. Facilitate circulation of promotional materials amongst its members, non-members and others.
4. The two parties hereto undertake to jointly solicit for funds including public funds, donor funds, research grants, contributions, subscriptions and such related funds for the purpose of realizing any or all the objectives of the collaboration.
5. The overall Memorandum shall not entail any financial obligation for both the parties to enable them to carry out programme objectives.
6. Both the parties /institutions shall abide by current professional guidelines on good Training practice and ethics available in relation to all Training activities and programs as followed in similar associations.
7. Both institutions further agree to bear the cost of administering the programme on such terms as shall be mutually agreed upon from time to time.

8. Both parties shall make rules governing the use of their respective facilities including library and workshops where such facilities are used to conduct any of the functions of this

collaboration as specified in 'agreements of collaboration' regarding each individual project/seminar or study.

9. Both parties jointly and independently agree to make available suitable facilities and personnel as and when required and on such terms as to fees, remuneration and any other incidents thereto as specified in 'agreements of collaboration' regarding each individual project.

10. The parties shall share both in gains and losses of the collaboration including educational training, skills and shall be decided on mutual consent.

11. The parties shall keep each other indemnified against all damages to or losses resulting from the fault of their respective agents and/or servants.

MANAGEMENT OF THE COLLABORATION

Each Institution shall designate a coordinator to develop and coordinate the program activities.

The initial coordinators are for VTU BELAGAVI
and

Sudarshan T N - Addl director for ASSOCHAM .

Notification of change or successor shall be in writing to the other party, subject to mutual consent from time to time.

MATERIAL TRANSFER AGREEMENT

Any and all materials relating to programs and research works and publications transferred between the parties shall be subject to an acceptable 'material transfer agreement' signed by the parties and appended to the agreement of collaboration regarding the individual projects.

DURATION OF THE MEMORANDUM

This Memorandum of Understanding shall come into effect from the date of execution and shall remain in force for a period of three years.

IMPLEMENTATION

All policies, guidelines, rules and regulations issued by both the parties shall be strictly observed at all times and disputes shall be subject to Bangalore Metropolitan Jurisdiction.

SETTLEMENT OF DISPUTES

The parties shall first use reasonable endeavours to amicably settle disputes arising out of or in connection with this Collaboration Agreement.

Where a dispute has not been amicably resolved the parties shall enter into structured negotiation through the appointment of an arbitrator acceptable to both sides. The award of the arbitrator shall be final and binding upon both the parties.

FORCE MAJEURE

Either party shall promptly notify the other party, in writing, of any situation or event arising from circumstances beyond their control, which they could not have reasonably foreseen, and which make the performance of all or part of the parties obligations under this contract impossible. Upon notification of the occurrence of such a situation or event, the performance of this contract shall be deemed to be postponed for a period of time equivalent to that caused by the Force Majeure and reasonable period not exceeding one (1) week thereafter shall be allowed for remobilisation to continue the performance of the contract.

REVIEW AND AMENDMENTS

The Memorandum may be amended or revised if both parties agree. Such amendments or revision shall be effective from the date of signature. Amendments may be decided at any time and shall be made in writing upon mutual consent of the parties.

TERMINATION OF MEMORANDUM

The memorandum of Understanding may be terminated with immediate effect by mutual agreement between the parties or by either party giving the other not less than three (3) months notice in writing.

IN WITNESS WHEREOF, the Parties hereto have executed this Memorandum of Understanding this 21st Day of April 2016

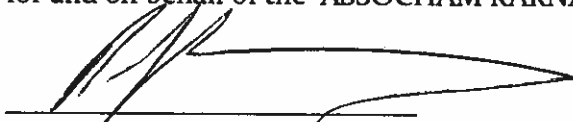
SIGNED for and on behalf of the **VTU BELAGAVI**



VTU BELAGAVI

SIGNED

for and on behalf of the **ASSOCHAM KARNATAKA BANGALORE:**



ASSOCHAM -R SHIVAKUMAR -CHAIRMAN

In the Presence of :

1

2

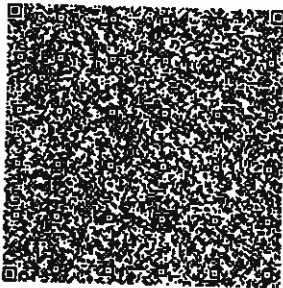


सत्यमेव जयते

INDIA NON JUDICIAL
Government of Karnataka

e-Stamp

Certificate No. : IN-KA896178873251780
Certificate Issued Date : 06-Aug-2016 01:02 PM
Account Reference : NONACC (FI)/ kaksfcl08/ NAGARABAVI/ KA-BN
Unique Doc. Reference : SUBIN-KAKAKSFCL08296482425947670
Purchased by : VISVESVARAYA TECHNOLOGICAL UNIVERSITY BELAGAVI
Description of Document : Article 12 Bond
Description : MEMORANDUM OF UNDERSTANDING
Consideration Price (Rs.) : 0
(Zero)
First Party : DEPARTMENT OF MINES AND GEOLOGY BANGALORE
Second Party : VISVESVARAYA TECHNOLOGICAL UNIVERSITY BELAGAVI
Stamp Duty Paid By : VISVESVARAYA TECHNOLOGICAL UNIVERSITY BELAGAVI
Stamp Duty Amount(Rs.) : 200
(Two Hundred only)



.....Please write or type below this line.....

Memorandum of Understanding

This Memorandum of Understanding is signed on this 06th day of August month of year 2016 between Department of Mines and Geology, No-49, Khanija Bhavan, Race Course Road, Bangalore represented by its Commissioner or Director, as the case may be, and hereinafter called the First Party [which expression shall, unless repugnant to the context, include its successor and assignees of the First Party].

And the Visvesvaraya Technological University, Office at Address Jnana Sangama, Belagavi, Karnataka 590 018 represented by its Registrar and hereinafter called the Second Party [which expression shall, unless repugnant to the context, include its successors and assignees of the second party].

Statutory Alert:

1. The authenticity of this Stamp Certificate should be verified at "www.shcilestamp.com". Any discrepancy in the details on this Certificate and its availability on the website renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate.
3. In case of any discrepancy please inform the Competent Authority.

eslatur

Whereas the First Party intends that manufactured sand (M-sand), produced by licensed M-sand crushing units in the state of Karnataka, which is used in building construction both in Government and Private Civil works should be as per Indian Standard Codes (IS Codes) and should be fit for use in building construction.

Whereas the Second Party confirms that the Civil Engineering Departments of the Engineering Colleges affiliated to the Visvesvaraya Technological University have facilities and technical manpower to test M-Sand samples to check their meeting the standards laid down by the Indian Standard Codes and to carry out further tests to confirm the suitability of M-Sand samples in use in building construction.

Therefore, now both the parties sign this MoU for testing of M-Sand samples in the Civil Engineering Departments of the Engineering Colleges affiliated to the Second Party with the objective that M-Sand production in the state is of quality that meets the standards prescribed in the Indian Standard Code and is fit for use in building construction.

Responsibilities

First Party:

1. The first party will authorize the Deputy Directors / Senior Geologist / Geologist of Department of Mines and Geology or District Task Force Committee, District Sand Monitoring Committee and District crusher Committee to nominate officers to collect sample of M-sand from M-Sand production units stock yards, M-sand transportation vehicles and from consumption sites and provide these samples of M-sand to Engineering colleges affiliated to the Second Party for analysis of the samples for compliance to Indian Standard Code and any additional analysis to confirm the samples' suitability for use in building construction and to pay the agreed upon fees for such analysis.
2. The nominated Officers as mentioned in Paragraph 1 or officers nominated by the District Task Force, District Sand Monitoring Committee, District Crusher Committee shall send sealed sample bags of M-Sand to the Engineering Colleges affiliated to the Second Party through the Deputy Director / Sr. Geologist / Geologist of the Department of Mines and Geology of the concerned District.
3. The samples sent to the Engineering Colleges affiliated to the Second Party by Deputy Director / Senior Geologist / Geologist of the Department of Mines and Geology taken from different sources shall not reveal the identity of the owners and a separate sample code shall be given by the Deputy Director / Senior Geologist / Geologist of the Department of Mines and Geology to each of the sample to be analyzed by Engineering Colleges affiliated to the Second Party.

Es. Patil

Second Party:

4. The second party shall give instructions to all the Engineering Colleges having Civil Engineering Department to adhere to the following:-
 - (a) The M-sand samples shall be subjected to sieve analysis and any other additional analysis as per standard methodology to check the compliance of the sample to the specification of the Indian Standard Codes and its suitability for use in building construction.
 - (b) The Civil Engineering Department of the Engineering Colleges affiliated to the second party shall test the M-sand samples and give the analysis report duly signed by the Head of the Department to the concerned jurisdictional office of the Department of Mines and Geology. The analysis report shall mention as to whether the sample meets the specification of the Indian Standard Code and is suitable or not suitable for use in building construction purpose.
 - (c) M-sand sample supplied by the consumers as well as by the M-sand producing units shall also be tested by the Civil Engineering Departments of the Engineering Colleges affiliated to the Second Party and analysis report shall be issued to them. The analysis report shall mention as to whether the sample meets the specification of the Indian Standard Code and is suitable or not suitable for use in building construction purpose.
 - (d) The Civil Engineering Department Laboratory of the Engineering Colleges shall not be influenced by any pressure or any expectations in testing the M-sand samples supplied to them by consumers, M-sand producing unit owners or by officers nominated by the First Party.
 - (e) The Civil Engineering Department of the Engineering Colleges shall charge analysis fee for testing and analysis of each sample as fixed by the Second Party from time to time.
 - (f) The samples submitted by Department of Mines and Geology shall be charged on a monthly basis in a manner prescribed by the First and Second Party on mutual consultation.

5. The Second Party shall set up a five member Committee of the Heads of Department of Civil Engineering Department from amongst the engineering colleges affiliated to it for the purpose of (a) further improving the testing facilities of the engineering colleges (b) improving the methodology of collection of the samples (c) improving the methodology of testing the M-Sand samples (d)guiding the Department of Mines and Geology in its effort to see that quality M-Sand is produced in the state (e) interacting with the Department of Mines and Geology and the PWD to further the efforts on quality M-Sand production in the state and (f) prescribing the various tests that need to be done on M-Sand samples for ensuring its quality for use in building construction purposes. This Committee shall work in coordination with the Department of Mines and Geology and the PWD for its work. The Department of

Handwritten signatures and initials

Mines and Geology shall convene the meeting of the Committee and representatives of the PWD as well as other experts as necessary for the work listed at (a) to (f) in this paragraph.

6. The Second Party shall fix the rates of sieve analysis and other analysis in consultation with the First Party and the Public Works Department of the Government. The Department of Mines and Geology will facilitate this consultation.

Modification

Modification of this Memorandum of Understanding (MoU) shall be based on mutual consent.

Termination

This Memorandum of Understanding dated: ^{H. S. J.} ~~06~~ Aug-2016 shall be valid for a period of three years from the date of signing the understanding. The continuation or termination of the MOU shall be with mutual consent of both the parties.


Commissioner

Department of Mines & Geology,
Bangalore


Registrar

Visvesvaraya Technological University,
Belagavi

20
37



MEMORANDUM OF UNDERSTANDING INVEST KARNATAKA -IK 2016

This Memorandum of Understanding is signed on 04. 02. 2016 at Bangalore Palace in Bengaluru during "Invest Karnataka 2016."

Between

M/s. Dassault Systems India Pvt Ltd.

And

Visvesvaraya Technological Univesity

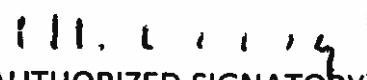
To achieve the following objectives:

- a. The Company proposes to set up a Centre of Excellence for Aerospace & Defence Industry in Karnataka.
- b. Visvesvaraya Technological University, Belagavi will provide the requisite support for implementation of the above project in the State as per the applicable Government policy

For and on behalf of
Visvesvaraya Technological University

For and on behalf of
M/s. Dassault Systems India Pvt Ltd.


(AUTHORIZED SIGNATORY) 4/2/16


(AUTHORIZED SIGNATORY)

Name: Prof. H. Maheshappa, M.E, PhD
Designation: Vice Chancellor

Name: Dr. Chandan Chowdhury
Designation: Managing Director, Dassault System

10

11

12

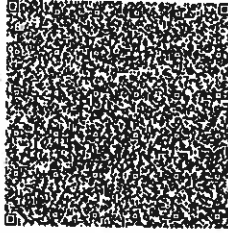


सत्यमेव जयते

INDIA NON JUDICIAL
Government of Karnataka

e-Stamp



Certificate No. : IN-KA96934986650645P
 Certificate Issued Date : 07-Mar-2017 03:42 PM
 Account Reference : NONACC (FI)/ kaksfcl08/ WILSON GARDEN1/ KA-BA
 Unique Doc. Reference : SUBIN-KAKAKSFCL0842674754071119P
 Purchased by : KBITS
 Description of Document : Article 12 Bond
 Description : TRIPET AGREEMENT
 Consideration Price (Rs.) : 0
 (Zero)
 First Party : KBITS
 Second Party : DASSAULT SYSTEMS INDIA PRIVATE LIMITED
 Stamp Duty Paid By : KBITS
 Stamp Duty Amount(Rs.) : 200
 (Two Hundred only)

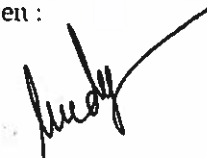



.....Please write or type below this line.....

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement ("MOA") has been entered into at Bangalore on this 31st day of March, 2017, in pursuance to Government order bearing no: ITD 291 ADM 2016 dated 22.02.2017 for formation of Centre for Excellence in Aerospace and Defense by entering into MoA, between :




Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

Statutory Alert:

1. The authenticity of this Stamp Certificate should be verified at www.stamps.gov and discrepancy in the details on this Certificate and its availability on the website renders it invalid.
2. The onus of checking the legitimacy is on the user of the stamp.
3. In case of any discrepancy please inform the Competent Authority.

REGISTRAR

Visvesvaraya Technological University
BELAGAVI.

10

0

0

Karnataka Biotechnology and Information Technology Services a nodal agency of Government of Karnataka represented by its Authorized representative, having its office at BMTC- Central Offices Building TTMC 'B' Block, 4th Floor, Double Road, NGO Colony, Wilson Garden, Bengaluru, Karnataka 560027 (hereinafter referred to as "KBITS", which expression shall unless repugnant to the context thereof, include its successors and assigns), of the **FIRST PART**

AND

Visvesvaraya Technological University, a Government of Karnataka university represented by its Authorized representative, having its Head Office at Institution of Printing Technology Building, First floor, Palace Road Bangalore-560001 India(hereinafter referred to as "VTU", which expression shall, unless repugnant to the context thereof, include its affiliates, associates, successors, assigns) of the **SECOND PART**

PART

AND



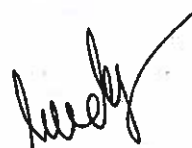
Dassault Systèmes India Private Limited, a Company incorporated under the Companies Act, 1956 represented by its Authorized representative, having its Registered Office at M-13, LGF, South Extension Part 2, New Delhi 110049 (hereinafter referred to as "3DS", which expression shall, unless repugnant to the context thereof, include its affiliates, associates, successors, assigns) of the **THIRD PART**


BACKGROUND:

1. The Party of the First Part is an organization which helps the Department of Information Technology and Biotechnology in facilitating and promoting the Information Technology and Biotech sectors in the state. The First Party aims to build skills in emerging areas of importance such as Aerospace and Defense
2. The Party of the Second Part is a Government of Karnataka technical university

Centre for Excellence In Aerospace & Defense

2




REGISTRAR
Visvesvaraya Technological University
BELAGAVI.


Managing Director &
Karnataka Biotechnology &
Information Technology Services
Bangalore

11

12

13

under the Department of Higher Education and is responsible for creating skilled resources in various disciplines including aerospace and defense.

3. The Party of the Third Part is the Indian subsidiary of Dassault Systèmes S.E., which specializes in the production of 3D Solution Experiences for different industries.
4. The Aerospace and Defense industry in India is one of the fastest growing markets in the world. The Aerospace/Aviation sector is projected to be the third largest aviation market in the world by 2020 and is likely to see investments totaling USD 12 billion during 2012-2017. Similarly, the defense-manufacturing sector in India is also on the cusp of exponential growth given the focus of Government of India on indigenous manufacturing of defense equipment. It is expected that the defense-manufacturing sector alone will see investments to the tune of INR 250 billion in the next 7-8 years with the view of reducing the 60% foreign imports. Bangalore is known as the Silicon Valley of India for IT and the state of Karnataka now aspires to be an International Hub for Aerospace and Defense. However, the growth of the sectors depends heavily on the availability of industry ready engineers/professionals who can be leveraged for project deployments with minimal on the job trainings.
5. Accordingly, the Government of Karnataka vide its Government Order No. ITD 291 ADM 2016 dated 22.02.2017 is pleased to accord administrative approval for setting up Centre of Excellence in Aerospace and Defense in collaboration with Dassault Systèmes and Visvesvaraya Technological University, at an estimated project cost of Rs. 288.68 crores, out of which Rs. 203.42 crores will be towards the capital expenditure and Rs. 85.26 crores towards the operational expenditure over a period of 3 years.

Centre for Excellence in Aerospace & Defense



REGISTRAR
Visvesvaraya Technological University
BELAGAVI.

3
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

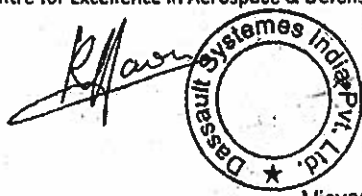
100

100

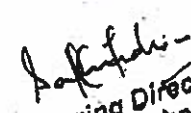
100

6. The project cost would be met by Government of Karnataka through KBITS, Dassault Systèmes and Visvesvaraya Technological University as detailed in Government Order No. ITD 291 ADM 2016 dated 22.02.2017 which is part of this MoA as Annexure C.
7. The objective of establishing a Centre of Excellence in Aerospace and Defense is skill development and providing industry ready manpower to a thriving Aerospace industry in Bengaluru and other aerospace hubs like Belagavi in Karnataka. The Department of IT, BT and S&T has received a proposal from 3DS to partner with the department in establishing a Center of Excellence on Aerospace and Defense (hereinafter referred to as "COE").
8. The proposed COE will increase employability of Indian engineers both in India and overseas. The proposed COE will also be a key enabler for increasing employability of engineers; enhance high-end skills of working professionals and attract investment to Karnataka through availability of talent pool specifically developed for this industry. The COE would provide high-end training and skill development for about 1,600 engineers per annum. The COE aims to enable the following:
 - a. The Government of Karnataka will have access to 3DS software, best practices and training materials on the Aerospace and Defense sector for the COE.
 - b. Training in academia (for skill enabling of engineering students in the colleges and universities in Karnataka)
 - c. Training the trainers in academia
 - d. Training working professionals from private sector
 - e. Skill training and certification for students to enhance employability
 - f. Research projects undertaken by research institutes
 - g. Research projects in collaboration with industry

Centre for Excellence in Aerospace & Defense



REGISTRAR
Visvesvaraya Technological University
BELAGAVI.


Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

100

100

100

The detailed schedule of activities along with timelines involved in establishment of the COE is detailed under Annexure E to this MOA.

For avoidance of doubt, 3DS software access and usage within COE shall only be limited to educational and training purposes and excludes any other direct or indirect usage, for any commercial purpose of KBITS, VTU and/or any third party.

9. Therefore, to give effect to the resolution of Government Order No. ITD 291 ADM 2016 dated 22.02.2017 and to formalise and specifically list the roles and responsibilities of all the three parties to this MOA is as follows :

THE PARTIES HEREBY AGREE AS FOLLOWS:

SECTION A: ROLE OF THE FIRST PARTY

1. To allocate and disburse required funding for the COE, as specified in Annexure C.
2. To disburse the said funding in accordance with the timelines mutually agreed upon between the Parties as specified in Annexure C.
3. The above-mentioned funding shall be utilized for the purpose of the setup and management of the COE, including the expenses for conducting training therein.
4. To be the primary licensee of 3DS software for the COE.
5. To abide with the terms and conditions governing the 3DS Software licenses (as per TCLOSA Ref: 06063-2016 DS India).
6. To constitute a Governing Committee having representatives from all three Parties to this MOA and any other experts, for periodic review of the COE and providing advice to the CEO of the COE on the matters relating to the management of the COEs as well as training outcomes ("Governing Committee").

Centre for Excellence in Aerospace & Defense



REGISTRAR
Svesvaraya Technological University
BELAGAVI.

5
Handwritten signature
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

100

100

100

The Governing Committee will meet at least once in six months or as and when required.

7. To constitute an Executive Committee comprising of the COE CEO and one or more representatives from VTU and an invitee representing KBITS to the Committee to assist the CoE in formulating operational details indicating timelines, method of students selection, fee structure etc at the time of setup of the COE and also assist as and when required for the day to day management of the COE ("Executive Committee").
8. To constitute a Training Committee with representatives from 3DS, VTU and other experts, who will review and approve the curriculum and syllabus for the training courses under both Basic and Advance level courses ("Training Committee").
9. The following reports and documentation may be considered for submission prior to release of any tranche of funding:
 - a. A periodic progress report (quarterly/bi-annual) that details the developments and other details relevant to the utilisation of the funds disbursed by KBITS, progress in the completion of the COE Milestones and other details relevant to the operationalisation of the COE, in the format approved by the Governing Committee.
 - b. A yearly report that details the manner of utilisation of all funds disbursed by KBITS in such year in addition to any record, document, receipt, voucher and other relevant document that KBITS may request to satisfy itself of the manner of usage of the funding disbursed.
 - c. The above reports will be co-signed by the representative of VTU on the Executive Committee.

Centre for Excellence in Aerospace & Defense




REGISTRAR
Sri Sivasvaraya Technological University
BELAGAVI.


Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

100

100

100

SECTION B: ROLE OF THE SECOND PARTY:

1. Shall be the host institute for the establishment of the COE and will be responsible for the management and day-to-day management of the COE, as per its guidelines.
2. Shall provide the necessary facility and infrastructure, as detailed below (and further detailed in Annexure A), for the setup of the COE:
 - a. Classrooms as required for the COE;
 - b. IT Hardware, in accordance with the specifications recommended for the 3DS Software;
 - c. Electrical, water and Air-conditioning fittings;
 - d. High speed internet and network connections across the COE labs;
 - e. Administration office;
 - f. Conference/ Meeting rooms;
 - g. Office administrative and facility management staff (including 1 center coordinator, 2 admin staff and 2 security staff);
 - h. Staff to be trained under the 'train-the-trainer' programme in the COE.
3. Will provide access to 3DS personnel to the COE premises.
4. Shall be responsible for determining the selection criteria for students who will avail training in the COE and the enrollment of such selected students.
5. Shall comply with the terms and conditions governing the 3DS Software licenses (i.e. TCLOSA Ref: 06063-2016 DS India).
6. Shall jointly certify along with the other parties the successful completion of the training course by students, based on VTU's guidelines.
7. Shall be responsible to decide on any applicable course fee structure and the collection and utilization of the same.

Centre for Excellence in Aerospace & Defense



REGISTRAR
Visvesvaraya Technological University
BELAGAVI.

R. M. Rao
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

SECTION C: ROLE OF THE THIRD PARTY:

1. Will provide the services specified in Annexure B (SOW), which includes providing resources for the services of the CoE, training content development and delivery at the CoE.
2. Will recommend training materials for the course, which will be reviewed and validated by the Training Committee. Such training materials shall only be accessed and utilized for the purpose of training in the COE and will be kept confidential from all third parties.
3. Shall provide 25 software packages with perpetual licenses for training and research purposes in Advance module and 60 Basic packages for usage as floating perpetual licenses.
4. Will provide relevant marketing and branding materials for use by KBITS and VTU for the COE.
5. Shall provide joint certificates along with first and second party to students upon completion of training courses

SECTION D: LICENSING & SERVICES

KBITS has issued a letter to 3DS for the procurement of software for the COE bearing Ref No. KBITS - 18 - SWC - 2016-17 dated 31st December 2016 ("KBITS Letter"), for an amount of Rs. 16.68 Crores (software Licenses + software support for first year), as agreed to vide DS Quote PO_BIN00002977 and on the terms and conditions mentioned in TCLOSA Ref: 06063-2016 DS India, annexed hereto as Annexure D. A Government order no ITD 291 ADM 2016 dated 22.02.2017, annexed hereto as Annexure C, has been issued approving the establishment of COE for Aerospace and Defense as per the 3DS Proposal at Annexure A and ratifying action taken by KBITS.

Centre for Excellence in Aerospace & Defense



REGISTRAR
Visvesvaraya Technological University
BELAGAVI.


Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

100

100

100

For the sake of clarity, floating licenses (as mentioned in this MoA under Section C) are provided to permit VTU to install the 3DS software at one central server and access the same remotely from the COE. The licenses would not be construed as transferable or assignable to any other party.

3DS will provide the training services for the COE pursuant to the Statement of Work, annexed hereto as Annexure B and incorporated herein by reference.

SECTION E: MISCELLANEOUS

1. Representations and Warranties:

Each Party herein individually represents and warrants that:

- a. It has the power and is duly authorised to enter into this Agreement and execute the terms listed herein.
- b. This Agreement does not contravene any existing law or obligation by which the Party is bound.
- c. It is not subject to any agreement, judgment or order that is inconsistent with or adverse to the terms and conditions of this Agreement.

2. Indemnity and Limitation of Liability:

Each Party to this Agreement shall indemnify and hold harmless the counter-Parties, their officers, directors, employees, customers and agents from any and all claims, losses, liabilities, damages, expenses and costs (including attorneys' fees and court costs) which result from a third party claim due to the gross negligence or willful misconduct by such Party ("Claim"), provided that written notice of any such Claim is provided within 30 (thirty) days of the alleged breach and provided that the Parties have the right to participate in the defence of any such Claim at their own expense.

Centre for Excellence in Aerospace & Defense



REGISTRAR
Visvesvaraya Technological University
BELAGAVI.

9
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

11/11/11

11

11

VTU and 3DS shall indemnify and hold harmless the KBITS against any and all claims that may be initiated by any and all employees or staff members engaged by VTU and 3DS respectively in the implementation and operationalisation of the COE in relation to non - payment of salary dues/arrears, statutory dues, incentives, bonus and any all manner of claims that may be raised by such employees/staff members and third-parties.

No party herein will be liable for any damages, costs, expenses, or any other such manner of liability arising out of or relating to any aspect of the implementation and operation of the COE or for any damages caused where the fault is solely attributable to one or more of the counter-parties.

3. Confidentiality:

- a. "Confidential Information" shall reference all information relating to and concerning business operations, products, applications, services and any commercial, financial and technical or non-technical detail including without limitation or exception any and all information shared regarding systems, designs, specifications, technologies, techniques, projects, planned projects, markets, supply chain specifications, customers, employees, agents, investors, investment amounts, potential investors, liabilities, loans, debt instruments issued, branding, merchandising, data analysis including revenue projections, cost summaries, pricing formulae, technical know-how and any other intellectual property, and the like, which is disclosed (a) in writing and conspicuously marked as being the Disclosing Party's Confidential Information; or (b) orally, visually or by delivery of non tangible items, which is identified as Confidential Information at the time of disclosure and confirmed and identified in

10

Centre for Excellence in Aerospace & Defense



REGISTRAR
Jyotsnaraya Technological University
BELAGAVI.

Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

10

11

12

- writing within fifteen (15) days of disclosure, including the content and the existence, negotiations and communications relating to this MoA.
- b. Each Party will maintain the confidentiality of all Confidential Information disclosed by either counter-Party to such Party.
- c. Neither Party shall, at any time for a period of five (5) years from the date of disclosure, without the written consent of the counter-Party, divulge or permit its officers, employees, agents, advisers or contractors to divulge to any person any Confidential Information disclosed to it.
- d. The obligations of confidentiality herein shall not apply to any information:
- i. Which is or becomes publicly available other than by breach of this MOA by any Party;
 - ii. Which is in or comes into the possession of the concerned Party prior to the date of execution hereof and which was not or is not obtained under any obligation of confidentiality; or
 - iii. Which is required by Applicable Laws or appropriate regulatory authorities to be disclosed, provided, however, the Party to whom such request for disclosure is made shall make best efforts to give prior notice of at least 10 (ten) Business Days of such request to the concerned counter-Party and the Party shall restrict the disclosure of Confidential Information to the minimum required extent.

4. **No Agency:**

The Parties acknowledge that this Agreement is on a principal-to-principal basis and nothing contained in this document shall be deemed to create an association, partnership, joint venture, master/servant, principal/agent or an employer-employee relationship

Centre for Excellence in Aerospace & Defense



REGISTRAR
Visvesvaraya Technological University
BELAGAVI.

11
Sakshin
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

5. **Responsible Points of Contact:**

- a. **KBITS – Managing Director**
- b. **VTU – Vice chancellor**
- c. **3DS – Aerospace & Defense Industry Director**

6. **Term.** This Memorandum of Agreement shall be effective on 31st March 2017 and remain valid for a period of One (1) year, with the option to extend by two years on year on year basis by mutual consent for the software updation / license charges and faculty & training.

7. **Termination**

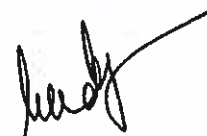
Notwithstanding anything stated herein any Party herein shall have the right to terminate this MoA by providing 30 [thirty] days written notice upon the breach of the terms and conditions of this MoA by a counter-party and failure to rectify such breach within [30] days of the receipt of a notice issued by either counter-Party to such party intimating it of such breach.

KBITS shall have the right to terminate this MoA by providing 30 [thirty] days' written notice upon the occurrence of any of the following:

- a. Failure to achieve any of the COE milestones, which is not resolved within thirty (30 days from the date of such notice.
- b. Misuse or misallocation of any funds that are disbursed by KBITS.
- c. Any internal administrative reasons or other such decision made by the Government of Karnataka that necessitates such termination or renders the Program no longer viable or non-operational.

Centre for Excellence in Aerospace & Defense




REGISTRAR
Visvesvaraya Technological University
BELAGAVI.


Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

100

100

100

Effect of Termination:

Upon the termination of this MoA on account of any misuse or misappropriation of funds that are disbursed by KBITS, the Party that has misused or misappropriated such funds shall:

- d. Make full payment of the released funding by KBITS to the extent to which it is misallocated or misappropriated as on the date of termination to KBITS within [30] days from the date of termination.
- e. Refund to KBITS, within 7 [seven] days of termination, any and all amounts of the funding disbursed by KBITS that is unspent or unapplied as of the date of termination.

8. Arbitration.

All disputes arising out of or in relation to this Agreement shall be first referred to the Governing Committee for amicable settlement of the same. However if such dispute is not settled amicably within 30 [thirty] days of the referral to the Governing Committee the Parties shall resolve the dispute by means of arbitration pursuant to the Arbitration and Conciliation Act, 1996:

The arbitration shall be conducted by an arbitral tribunal comprising of 3 (three) arbitrators, with each party appointing 1 (one) arbitrator empanelled with the Arbitration Centre – Karnataka (Domestic and International) within [30] days from the expiry of the Conciliation Period. The 3 (three) arbitrators appointed in such manner shall, within [30] days of their appointment mutually identify and appoint the presiding arbitrator amongst themselves.

The arbitration proceedings shall be conducted in English language only and the venue for arbitration shall be at Bangalore.

The award of the arbitral tribunal shall be final and binding on the Parties.

Centre for Excellence in Aerospace & Defense



REGISTRAR
Visvesvaraya Technological University
BELAGAVI.

13
Managing Director
Karnataka Biotechnology &
Technology Services
Centre

9. **Notices.** Unless otherwise provided herein, all notices required hereunder shall be in writing (including via email), in English, and shall be deemed to have been given on: (i) the date delivered in person or by express courier service, (ii) three (3) days after sending the notice if sent by certified or registered mail, or (iii) the date sent by confirmed facsimile, addressed to the parties at their address mentioned hereinabove, or at such other address as either party may designate to the other by notice served as hereby required, or contained in the relevant order form.


10. **Force Majeure.** Neither party hereto shall be liable for any default in the performance of its obligations under this Agreement resulting from (i) a case of force majeure as defined by the law governing this Agreement and the courts in such jurisdiction, or (ii) the following causes: strikes (whether previously announced or not), war (declared or not), riots, governmental action, acts of terrorism, acts of God (fire, flood, earthquake, etc.), or any electrical, utility or telecommunication outages. Force Majeure Event" shall mean any cause affecting the performance by a Party of its obligations arising from acts, events, omissions, happenings or non-happenings beyond its reasonable control, including acts of God, riots, war or armed conflict, embargo, acts of terrorism, acts of government, local government or Regulatory Bodies, fire, flood, storm or earthquake, or disaster but excluding any industrial dispute relating to either Party or either Party's personnel.

11. **Severability.** If any provision of this Agreement is found by a court of competent jurisdiction or arbitrator to be illegal, void or unenforceable, the other provisions shall remain in full force and effect, and the affected provision will be

Centre for Excellence in Aerospace & Defense



REGISTRAR
Visvesvaraya Technological University
BELAGAVI.

 14
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

modified so as to render it enforceable and effective to the maximum extent possible in order to effect the original intent of the parties.

12. **Transfer, Assignment & Subcontract.** Neither party will assign or transfer or delegate its rights and obligations without the written consent of the other two parties. This Agreement shall be binding upon, and inure to the benefit of each party and its successors and assigns.

13. **Amendments & Non-Waiver.** No waiver, alteration, modification, or cancellation of any of the provisions of this Agreement shall be binding unless made by written amendment signed by both parties. A party's failure at any time to require performance of any provision hereof shall in no manner affect its right at a later time to enforce that or any other provision.

14. **Entire Agreement; Order of Precedence.** This Agreement along with the annexures hereto comprises the complete agreement between the parties relating to the subject matter hereof and supersedes all prior and contemporaneous proposals, agreements, understandings, representations, purchase orders and communications, whether oral or written. If there is a discrepancy, inconsistency or contradiction between this MOA and the SOW, the provisions of the SOW shall prevail in respect of any conflict with respect to operational and procedural measures, with the MoA prevailing in respect of the enforcement and interpretation of any substantive legal right.

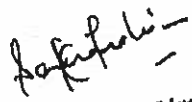
15. **Governing law and jurisdiction.** This MOA shall be governed by the laws of India and the Courts at Bangalore shall have jurisdiction over all matters arising herefrom.

Centre for Excellence in Aerospace & Defense





REGISTRAR
Visvesvaraya Technological University
BELAGAVI.


15
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

Signed at Department of IT, BT and S & T, 6th Floor, 5th Stage, MS Building, on 31st this day of March 2017.

For and on behalf of **Managing Director**
Karnataka Biotechnology &
Information Technology Services
Bangalore

Karnataka Biotechnology and Information Technology Services
Government of Karnataka
Managing Director

REGISTRAR
For and on behalf of
Visvesvaraya Technological University
BELAGAVI
Registrar



For and on behalf of
Dassault Systemes India Private Limited
Mr. Samson Khaou
Managing Director

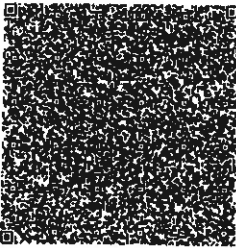


सत्यमेव जयते

INDIA NON JUDICIAL
Government of Karnataka

e-Stamp


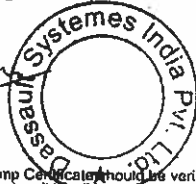
Certificate No. : IN-KA96934986650645P
Certificate Issued Date : 07-Mar-2017 03:42 PM
Account Reference : NONACC (FI)/ kaksfci08/ WILSON GARDEN1/ KA-BA
Unique Doc. Reference : SUBIN-KAKAKSFCL0842674754071119P
Purchased by : KBITS
Description of Document : Article 12 Bond
Description : TRIPET AGREEMENT
Consideration Price (Rs.) : 0
(Zero)
First Party : KBITS
Second Party : DASSAULT SYSTEMS INDIA PRIVATE LIMITED
Stamp Duty Paid By : KBITS
Stamp Duty Amount(Rs.) : 200
(Two Hundred only)




.....Please write or type below this line.....

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement ("MOA") has been entered into at Bangalore on this 31st day of March, 2017, in pursuance to Government order bearing no: ITD 291 ADM 2016 dated 22.02.2017 for formation of Centre for Excellence in Aerospace and Defense by entering into MoA, between :


Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

Statutory Alert:

1. The authenticity of this Stamp Certificate should be verified at www.shilestamp.com. Any discrepancy in the details on this Certificate and as available on the website renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate
3. In case of any discrepancy please inform the Competent Authority

Karnataka Biotechnology and Information Technology Services a nodal agency of Government of Karnataka represented by its Authorized representative, having its office at BMTC- Central Offices Building TTMC 'B' Block, 4th Floor, Double Road, NGO Colony, Wilson Garden, Bengaluru, Karnataka 560027 (hereinafter referred to as "KBITS", which expression shall unless repugnant to the context thereof, include its successors and assigns), of the **FIRST PART**

AND

Visvesvaraya Technological University, a Government of Karnataka university represented by its Authorized representative, having its Head Office at Institution of Printing Technology Building, First floor, Palace Road Bangalore-560001 India (hereinafter referred to as "VTU", which expression shall, unless repugnant to the context thereof, include its affiliates, associates, successors, assigns) of the **SECOND PART**

PART

AND

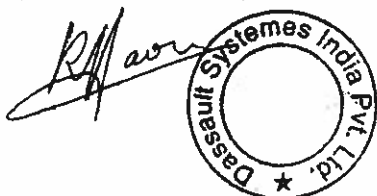
Dassault Systèmes India Private Limited, a Company incorporated under the Companies Act, 1956 represented by its Authorized representative, having its Registered Office at M-13, LGF, South Extension Part 2, New Delhi 110049 (hereinafter referred to as "3DS", which expression shall, unless repugnant to the context thereof, include its affiliates, associates, successors, assigns) of the **THIRD PART**

BACKGROUND:

1. The Party of the First Part is an organization which helps the Department of Information Technology and Biotechnology in facilitating and promoting the Information Technology and Biotech sectors in the state. The First Party aims to build skills in emerging areas of importance such as Aerospace and Defense
2. The Party of the Second Part is a Government of Karnataka technical university

2

Centre for Excellence in Aerospace & Defense



Handwritten signature
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

under the Department of Higher Education and is responsible for creating skilled resources in various disciplines including aerospace and defense.

3. The Party of the Third Part is the Indian subsidiary of Dassault Systèmes S.E., which specializes in the production of 3D Solution Experiences for different industries.
4. The Aerospace and Defense industry in India is one of the fastest growing markets in the world. The Aerospace/Aviation sector is projected to be the third largest aviation market in the world by 2020 and is likely to see investments totaling USD 12 billion during 2012-2017. Similarly, the defense-manufacturing sector in India is also on the cusp of exponential growth given the focus of Government of India on indigenous manufacturing of defense equipment. It is expected that the defense-manufacturing sector alone will see investments to the tune of INR 250 billion in the next 7-8 years with the view of reducing the 60% foreign imports. Bangalore is known as the Silicon Valley of India for IT and the state of Karnataka now aspires to be an International Hub for Aerospace and Defense. However, the growth of the sectors depends heavily on the availability of industry ready engineers/professionals who can be leveraged for project deployments with minimal on the job trainings.
5. Accordingly, the Government of Karnataka vide its Government Order No. ITD 291 ADM 2016 dated 22.02.2017 is pleased to accord administrative approval for setting up Centre of Excellence in Aerospace and Defense in collaboration with Dassault Systèmes and Visvesvaraya Technological University, at an estimated project cost of Rs. 288.68 crores, out of which Rs. 203.42 crores will be towards the capital expenditure and Rs. 85.26 crores towards the operational expenditure over a period of 3 years.

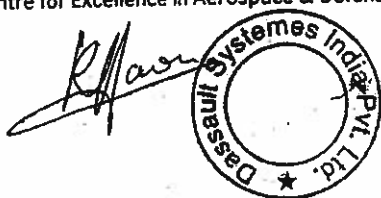
Centre for Excellence in Aerospace & Defense



3
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

6. The project cost would be met by Government of Karnataka through KBITS, Dassault Systèmes and Visvesvaraya Technological University as detailed in Government Order No. ITD 291 ADM 2016 dated 22.02.2017 which is part of this MoA as Annexure C.
7. The objective of establishing a Centre of Excellence in Aerospace and Defense is skill development and providing industry ready manpower to a thriving Aerospace industry in Bengaluru and other aerospace hubs like Belagavi in Karnataka. The Department of IT, BT and S&T has received a proposal from 3DS to partner with the department in establishing a Center of Excellence on Aerospace and Defense (hereinafter referred to as "COE").
8. ~~The proposed COE will increase employability of Indian engineers both in India and overseas.~~ The proposed COE will also be a key enabler for increasing employability of engineers; enhance high-end skills of working professionals and attract investment to Karnataka through availability of talent pool specifically developed for this industry. The COE would provide high-end training and skill development for about 1,600 engineers per annum. The COE aims to enable the following:
- a. The Government of Karnataka will have access to 3DS software, best practices and training materials on the Aerospace and Defense sector for the COE.
 - b. Training in academia (for skill enabling of engineering students in the colleges and universities in Karnataka)
 - c. Training the trainers in academia
 - d. Training working professionals from private sector
 - e. Skill training and certification for students to enhance employability
 - f. Research projects undertaken by research institutes
 - g. Research projects in collaboration with industry

Centre for Excellence in Aerospace & Defense



4
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

The detailed schedule of activities along with timelines involved in establishment of the COE is detailed under Annexure E to this MOA.

For avoidance of doubt, 3DS software access and usage within COE shall only be limited to educational and training purposes and excludes any other direct or indirect usage, for any commercial purpose of KBITS, VTU and/or any third party.

9. Therefore, to give effect to the resolution of Government Order No. ITD 291 ADM 2016 dated 22.02.2017 and to formalise and specifically list the roles and responsibilities of all the three parties to this MOA is as follows :

THE PARTIES HEREBY AGREE AS FOLLOWS:

SECTION A: ROLE OF THE FIRST PARTY

1. To allocate and disburse required funding for the COE, as specified in Annexure C.
2. To disburse the said funding in accordance with the timelines mutually agreed upon between the Parties as specified in Annexure C.
3. The above-mentioned funding shall be utilized for the purpose of the setup and management of the COE, including the expenses for conducting training therein.
4. To be the primary licensee of 3DS software for the COE.
5. To abide with the terms and conditions governing the 3DS Software licenses (as per TCLOSA Ref: 06063-2016 DS India).
6. To constitute a Governing Committee having representatives from all three Parties to this MOA and any other experts, for periodic review of the COE and providing advice to the CEO of the COE on the matters relating to the management of the COEs as well as training outcomes ("Governing Committee").

Centre for Excellence in Aerospace & Defense



5
Safathun
**Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore**

The Governing Committee will meet at least once in six months or as and when required.

7. To constitute an Executive Committee comprising of the COE CEO and one or more representatives from VTU and an invitee representing KBITS to the Committee to assist the CoE in formulating operational details indicating timelines, method of students selection, fee structure etc at the time of setup of the COE and also assist as and when required for the day to day management of the COE ("Executive Committee").
8. To constitute a Training Committee with representatives from 3DS, VTU and other experts, who will review and approve the curriculum and syllabus for the training courses under both Basic and Advance level courses ("Training Committee").
9. The following reports and documentation may be considered for submission prior to release of any tranche of funding:
 - a. A periodic progress report (quarterly/bi-annual) that details the developments and other details relevant to the utilisation of the funds disbursed by KBITS, progress in the completion of the COE Milestones and other details relevant to the operationalisation of the COE, in the format approved by the Governing Committee.
 - b. A yearly report that details the manner of utilisation of all funds disbursed by KBITS in such year in addition to any record, document, receipt, voucher and other relevant document that KBITS may request to satisfy itself of the manner of usage of the funding disbursed.
 - c. The above reports will be co-signed by the representative of VTU on the Executive Committee.



SECTION B: ROLE OF THE SECOND PARTY:

1. Shall be the host institute for the establishment of the COE and will be responsible for the management and day-to-day management of the COE, as per its guidelines.
2. Shall provide the necessary facility and infrastructure, as detailed below (and further detailed in Annexure A), for the setup of the COE:
 - a. Classrooms as required for the COE;
 - b. IT Hardware, in accordance with the specifications recommended for the 3DS Software;
 - c. Electrical, water and Air-conditioning fittings;
 - d. High speed internet and network connections across the COE labs;
 - e. Administration office;
 - f. Conference/ Meeting rooms;
 - g. Office administrative and facility management staff (including 1 center coordinator, 2 admin staff and 2 security staff);
 - h. Staff to be trained under the 'train-the-trainer' programme in the COE.
3. Will provide access to 3DS personnel to the COE premises.
4. Shall be responsible for determining the selection criteria for students who will avail training in the COE and the enrollment of such selected students.
5. Shall comply with the terms and conditions governing the 3DS Software licenses (i.e. TCLOSA Ref: 06063-2016 DS India).
6. Shall jointly certify along with the other parties the successful completion of the training course by students, based on VTU's guidelines.
7. Shall be responsible to decide on any applicable course fee structure and the collection and utilization of the same.

Centre for Excellence in Aerospace & Defense



S. Srinivas
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

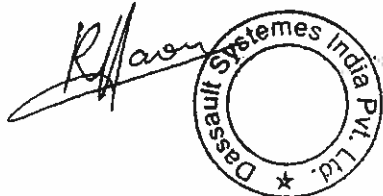
SECTION C: ROLE OF THE THIRD PARTY:

1. Will provide the services specified in Annexure B (SOW), which includes providing resources for the services of the CoE, training content development and delivery at the CoE.
2. Will recommend training materials for the course, which will be reviewed and validated by the Training Committee. Such training materials shall only be accessed and utilized for the purpose of training in the COE and will be kept confidential from all third parties.
3. Shall provide 25 software packages with perpetual licenses for training and research purposes in Advance module and 60 Basic packages for usage as floating perpetual licenses.
4. Will provide relevant marketing and branding materials for use by KBITS and VTU for the COE.
5. Shall provide joint certificates along with first and second party to students upon completion of training courses

SECTION D: LICENSING & SERVICES

KBITS has issued a letter to 3DS for the procurement of software for the COE bearing Ref No. KBITS - 18 - SWC - 2016-17 dated 31st December 2016 ("KBITS Letter"), for an amount of Rs. 16.68 Crores (software Licenses + software support for first year), as agreed to vide DS Quote PO_BIN00002977 and on the terms and conditions mentioned in TCLOSA Ref: 06063-2016 DS India, annexed hereto as Annexure D. A Government order no ITD 291 ADM 2016 dated 22.02.2017, annexed hereto as Annexure C, has been issued approving the establishment of COE for Aerospace and Defense as per the 3DS Proposal at Annexure A and ratifying action taken by KBITS.

Centre for Excellence in Aerospace & Defense



S. Srinivas
8
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

For the sake of clarity, floating licenses (as mentioned in this MoA under Section C) are provided to permit VTU to install the 3DS software at one central server and access the same remotely from the COE. The licenses would not be construed as transferable or assignable to any other party.

3DS will provide the training services for the COE pursuant to the Statement of Work, annexed hereto as Annexure B and incorporated herein by reference.

SECTION E: MISCELLANEOUS

1. Representations and Warranties:

Each Party herein individually represents and warrants that:

- a. It has the power and is duly authorised to enter into this Agreement and execute the terms listed herein.
- b. This Agreement does not contravene any existing law or obligation by which the Party is bound.
- c. It is not subject to any agreement, judgment or order that is inconsistent with or adverse to the terms and conditions of this Agreement.

2. Indemnity and Limitation of Liability:

Each Party to this Agreement shall indemnify and hold harmless the counter-Parties, their officers, directors, employees, customers and agents from any and all claims, losses, liabilities, damages, expenses and costs (including attorneys' fees and court costs) which result from a third party claim due to the gross negligence or willful misconduct by such Party ("Claim"), provided that written notice of any such Claim is provided within 30 (thirty) days of the alleged breach and provided that the Parties have the right to participate in the defence of any such Claim at their own expense.



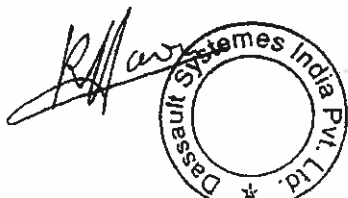
VTU and 3DS shall indemnify and hold harmless the KBITS against any and all claims that may be initiated by any and all employees or staff members engaged by VTU and 3DS respectively in the implementation and operationalisation of the COE in relation to non - payment of salary dues/arrears, statutory dues, incentives, bonus and any all manner of claims that may be raised by such employees/staff members and third-parties.

No party herein will be liable for any damages, costs, expenses, or any other such manner of liability arising out of or relating to any aspect of the implementation and operation of the COE or for any damages caused where the fault is solely attributable to one or more of the counter-parties.

3. Confidentiality:

- a. "Confidential Information" shall reference all information relating to and concerning business operations, products, applications, services and any commercial, financial and technical or non-technical detail including without limitation or exception any and all information shared regarding systems, designs, specifications, technologies, techniques, projects, planned projects, markets, supply chain specifications, customers, employees, agents, investors, investment amounts, potential investors, liabilities, loans, debt instruments issued, branding, merchandising, data analysis including revenue projections, cost summaries, pricing formulae, technical know-how and any other intellectual property, and the like, which is disclosed (a) in writing and conspicuously marked as being the Disclosing Party's Confidential Information; or (b) orally, visually or by delivery of non tangible items, which is identified as Confidential Information at the time of disclosure and confirmed and identified in

10



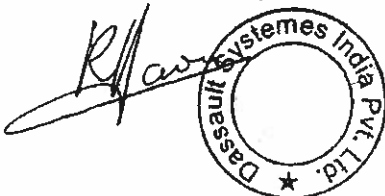
S. K. Srinivas
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

writing within fifteen (15) days of disclosure, including the content and the existence, negotiations and communications relating to this MoA.

- b. Each Party will maintain the confidentiality of all Confidential Information disclosed by either counter-Party to such Party.
- c. Neither Party shall, at any time for a period of five (5) years from the date of disclosure, without the written consent of the counter-Party, divulge or permit its officers, employees, agents, advisers or contractors to divulge to any person any Confidential Information disclosed to it.
- d. The obligations of confidentiality herein shall not apply to any information:
 - i. Which is or becomes publicly available other than by breach of this MOA by any Party;
 - ii. Which is in or comes into the possession of the concerned Party prior to the date of execution hereof and which was not or is not obtained under any obligation of confidentiality; or
 - iii. Which is required by Applicable Laws or appropriate regulatory authorities to be disclosed, provided, however, the Party to whom such request for disclosure is made shall make best efforts to give prior notice of at least 10 (ten) Business Days of such request to the concerned counter-Party and the Party shall restrict the disclosure of Confidential Information to the minimum required extent.

4. No Agency:

The Parties acknowledge that this Agreement is on a principal-to-principal basis and nothing contained in this document shall be deemed to create an association, partnership, joint venture, master/servant, principal/agent or an employer-employee relationship



5. **Responsible Points of Contact:**

- a. **KBITS – Managing Director**
- b. **VTU – Vice chancellor**
- c. **3DS – Aerospace & Defense Industry Director**

6. **Term.** This Memorandum of Agreement shall be effective on 31st March 2017 and remain valid for a period of One (1) year, with the option to extend by two years on year on year basis by mutual consent for the software updation / license charges and faculty & training.

7. **Termination**

Notwithstanding anything stated herein any Party herein shall have the right to terminate this MoA by providing 30 [thirty] days written notice upon the breach of the terms and conditions of this MoA by a counter-party and failure to rectify such breach within [30] days of the receipt of a notice issued by either counter-Party to such party intimating it of such breach.

KBITS shall have the right to terminate this MoA by providing 30 [thirty] days' written notice upon the occurrence of any of the following:

- a. Failure to achieve any of the COE milestones, which is not resolved within thirty (30 days from the date of such notice.
- b. Misuse or misallocation of any funds that are disbursed by KBITS.
- c. Any internal administrative reasons or other such decision made by the Government of Karnataka that necessitates such termination or renders the Program no longer viable or non-operational.



Effect of Termination:

Upon the termination of this MoA on account of any misuse or misappropriation of funds that are disbursed by KBITS, the Party that has misused or misappropriated such funds shall:

- d. Make full payment of the released funding by KBITS to the extent to which it is misallocated or misappropriated as on the date of termination to KBITS within [30] days from the date of termination.
- e. Refund to KBITS, within 7 [seven] days of termination, any and all amounts of the funding disbursed by KBITS that is unspent or unapplied as of the date of termination.

8. Arbitration.

All disputes arising out of or in relation to this Agreement shall be first referred to the Governing Committee for amicable settlement of the same. However if such dispute is not settled amicably within 30 [thirty] days of the referral to the Governing Committee the Parties shall resolve the dispute by means of arbitration pursuant to the Arbitration and Conciliation Act, 1996:

The arbitration shall be conducted by an arbitral tribunal comprising of 3 (three) arbitrators, with each party appointing 1 (one) arbitrator empanelled with the Arbitration Centre – Karnataka (Domestic and International) within [30] days from the expiry of the Conciliation Period. The 3 (three) arbitrators appointed in such manner shall, within [30] days of their appointment mutually identify and appoint the presiding arbitrator amongst themselves.

The arbitration proceedings shall be conducted in English language only and the venue for arbitration shall be at Bangalore.

The award of the arbitral tribunal shall be final and binding on the Parties.

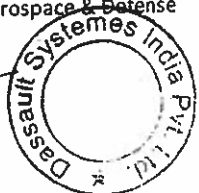
9. **Notices.** Unless otherwise provided herein, all notices required hereunder shall be in writing (including via email), in English, and shall be deemed to have been given on: (i) the date delivered in person or by express courier service, (ii) three (3) days after sending the notice if sent by certified or registered mail, or (iii) the date sent by confirmed facsimile, addressed to the parties at their address mentioned hereinabove, or at such other address as either party may designate to the other by notice served as hereby required, or contained in the relevant order form.

10. **Force Majeure.** Neither party hereto shall be liable for any default in the performance of its obligations under this Agreement resulting from (i) a case of force majeure as defined by the law governing this Agreement and the courts in such jurisdiction, or (ii) the following causes: strikes (whether previously announced or not), war (declared or not), riots, governmental action, acts of terrorism, acts of God (fire, flood, earthquake, etc.), or any electrical, utility or telecommunication outages. Force Majeure Event" shall mean any cause affecting the performance by a Party of its obligations arising from acts, events, omissions, happenings or non-happenings beyond its reasonable control, including acts of God, riots, war or armed conflict, embargo, acts of terrorism, acts of government, local government or Regulatory Bodies, fire, flood, storm or earthquake, or disaster but excluding any industrial dispute relating to either Party or either Party's personnel.

11. **Severability.** If any provision of this Agreement is found by a court of competent jurisdiction or arbitrator to be illegal, void or unenforceable, the other provisions shall remain in full force and effect, and the affected provision will be

Centre for Excellence in Aerospace & Defense

R. Rao



[Signature] 14
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

modified so as to render it enforceable and effective to the maximum extent possible in order to effect the original intent of the parties.

12. Transfer, Assignment & Subcontract. Neither party will assign or transfer or delegate its rights and obligations without the written consent of the other two parties. This Agreement shall be binding upon, and inure to the benefit of each party and its successors and assigns.

13. Amendments & Non-Waiver. No waiver, alteration, modification, or cancellation of any of the provisions of this Agreement shall be binding unless made by written amendment signed by both parties. A party's failure at any time to require performance of any provision hereof shall in no manner affect its right at a later time to enforce that or any other provision.

14. Entire Agreement; Order of Precedence. This Agreement along with the annexures hereto comprises the complete agreement between the parties relating to the subject matter hereof and supersedes all prior and contemporaneous proposals, agreements, understandings, representations, purchase orders and communications, whether oral or written. If there is a discrepancy, inconsistency or contradiction between this MOA and the SOW, the provisions of the SOW shall prevail in respect of any conflict with respect to operational and procedural measures, with the MoA prevailing in respect of the enforcement and interpretation of any substantive legal right.

15. Governing law and jurisdiction. This MOA shall be governed by the laws of India and the Courts at Bangalore shall have jurisdiction over all matters arising herefrom.

Centre for Excellence in Aerospace & Defense

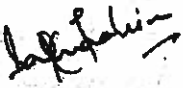




15
Managing Director
Karnataka Biotechnology &
Information Technology Services
Bangalore

Signed at Department of IT, BT and S & T, 6th Floor, 5th Stage, MS Building, on 31st this day of March 2017.

For and on behalf of **Managing Director**
Karnataka Biotechnology &
Information Technology Services
Bangalore



Karnataka Biotechnology and Information Technology Services
Government of Karnataka
Managing Director

For and on behalf of
Visvesvaraya Technological University
Registrar



For and on behalf of
Dassault Systemes India Private Limited
Mr. Samson Khaou
Managing Director

**Agreement on
Setting up and Maintenance of a
"Bosch Rexroth Training Partner" Center in India**

Between **Bosch Rexroth AG
Industrial Hydraulics
Maria-Theresien-Strasse
97816 Lohr am Main
Germany**

hereinafter referred to as 'BRAG'

and **Bosch Rexroth (India) Limited
Near Vatva Railway Station, Vatva
Ahmedabad - 382 445
India**

hereinafter referred to as 'BRIN'

on the one side

and **Visvesvaraya Technological University
"Jnana Sangama", Machhe
Belgaum, Karnataka 590 014
India**

hereinafter referred to as 'VTU'

on the other side

List of contents

	Page
Preamble	5
Article 1 Definitions	6
Article 2 Subject Matter	7
Article 3 No Joint Venture	7
Article 4 Obligations of VTU	8
Article 4.1 Building and Maintaining a Training Center	8
Article 4.2 Offering Training Courses	8
Article 4.3 Trainers	8
Article 4.4 Promotion	9
Article 4.5 Exclusive purchase and application of BRAG PRODUCTS	9
Article 5 Obligations of BRAG/BRIN	9
Article 5.1 Providing of Didactic Training System	9
Article 5.2 Providing of BRAG TTT Courses in line with the MoU	9
Article 5.3 Providing of BRAG TTT Courses (ongoing)	10
Article 5.4 Obligation of BRIN	10
Article 6 Trademarks and Promotional Materials	10
Article 6.1 Authorization	10
Article 6.2 Trademark	11
Article 6.3 Acknowledgements	11
Article 6.4 Limitation of Use	11
Article 6.5 Promotional Material	11
Article 7 Payments	12
Article 8 Term of Agreement	12
Article 8.1 Termination Events	13
Article 9 Intellectual Property Right	14
Article 10 Confidential Information	14
Article 11 Integration of Agreement	15
Article 12 Assignment	15
Article 13 Force Majeure	16

Article 14	Severability	16
Article 15	Language and Counterparts	16
Article 16	Notice	17
Article 17	Non Waiver	17
Article 18	General Provisions	18
Article 19	Governing Law	19
Article 20	Arbitration	19
Appendix		21

This AGREEMENT on setting up and maintenance of a "Bosch Rexroth Training Partner" Center in India (the "Agreement") is made on the 27th day of October, 2005.

BY AND BETWEEN

(1) Bosch Rexroth AG, a stock corporation duly registered in the Federal Republic of Germany. The address of the headquarters is as follows:
Bosch Rexroth AG, Heidehofstraße 31, 70184 Stuttgart, Deutschland (BRAG).

and

(2) Bosch Rexroth (India) Limited, a stock corporation duly registered in India. The address of the headquarters is as follows:
Near Vatva Railway Station, Vatva; Ahmedabad - 382 445; India (BRIN)

and

(3) Visvesvaraya Technological University, the training center partner having its campus located at "Jnana Sangama", Machhe; Belgaum, Karnataka 590 014; India (VTU)

(all the above individually referred to as a "Party" and all collectively referred to as the "Parties")

PREAMBLE

WHEREAS

- A. BRAG has developed a worldwide didactic system for the education on the effective application and efficient use of machines and systems (BRAG Training Course) involving the use of its proprietary hardware, courseware and teachware (the Technology),

- B. BRAG and BRIN are responsible for the implementation and the support of the BRAG Training Course in the territory of India in accordance with the terms and conditions of this Agreement,

- C. VTU is desirous of utilizing the didactic concept to educate its students at its campus in India,

- D. VTU is willing to receive and BRAG is willing to grant the License and BRAG is willing to provide the equipment as well as BRIN is willing to support the set up and maintenance of a Training Center based on the BRAG Training Courses subject to the terms and conditions set out below in this Agreement and its Appendices.

NOW THEREFORE, the Parties hereby agree as follows:

ARTICLE 1 – DEFINITIONS

The terms referred to in this Agreement shall have the following meanings:

- 1.1. “DIDACTIC CONCEPT”
shall mean the efficient combination of the hardware, teachware and courseware offered by BRAG for the industry-oriented basic and further training in the field of automation technology.
- 1.2. “PRODUCTS”
shall mean components, systems, services and rights of use according to Appendix 1.
- 1.3. “TRAINING CENTER”
shall mean the training center referred to in article 4.1 below.
- 1.4. “TC COURSES”
shall mean the Training Center Courses referred to in article 4.2 below.
- 1.5. “TTT COURSES”
shall mean the training courses by BRAG for trainees of VTU for the utilization of the DIDACTIC CONCEPT of BRAG
- 1.6. “CoA”
shall mean the Certificate of Achievement - confirms that the trainee successfully attended the TTT COURSE.
- 1.7. “MoU”
shall mean the Memorandum of Understanding in the sense of a declaration of intent for working out this contract (MoA) between BRAG and VTU
- 1.8. “KNOW-HOW”
shall mean experience and knowledge available from BRAG special technical attainments and know how, necessary and sufficient for implementing and maintaining the didactic concept of BRAG.

1.9. "AGREEMENT"

shall mean this Agreement on setting up and maintenance of a "Bosch Rexroth Training Partner" Center in India.

1.10. The "System"

shall mean the worldwide recognized didactic concept for training with regard to the efficient utilization of machines, systems and facilities.

ARTICLE 2 – SUBJECT MATTER

VTU will establish and maintain at the location of its campus as aforesaid a didactic training center for conducting the TC Courses according to the BRAG DIDACTIC CONCEPT subject to the terms and conditions set out below.

BRAG and BRIN shall support these efforts by granting the respective licenses, transferring the know-how, supplying parts, components and didactic systems to VTU, instructing and certifying VTU trainers, supplying material and providing training methods subject to the terms and conditions set out below.

VTU shall implement all the above in its Didactic Training Center, to establish and maintain a training facility according to the BRAG DIDACTIC CONCEPT.

ARTICLE 3 – NO JOINT VENTURE

The Parties agree to use their best efforts and good faith to develop and reach agreement on the terms and conditions of the contemplated contractual relationships, including all appendices thereto. The Parties further agree to use their best efforts and good faith in developing any additional agreements or understandings that may be necessary or appropriate for the desired framework of cooperation and long-term relationship contemplated herein (the "Cooperation").

It is specifically understood and agreed that the Parties shall retain their separate identities and that neither shall be the agent, principal, employee, employer, partner, or representative of the other, and that they do not intend by the Co-operation to create a joint entity, joint venture, partnership, corporate merger, or any other form of consolidation of their existing business or corporate units.

ARTICLE 4 – OBLIGATIONS OF VTU

4.1. Setting up and Maintaining a Training Center

VTU shall at its own costs and expenses set up and maintain a Training Center within its campus to implement the DIDACTIC CONCEPT of BRAG.

For the avoidance of doubt, VTU shall also be solely responsible for all present and future costs relating to the infrastructure of the Training Center including, but without limitation, the furniture, training system, library and eLearning facilities, certification of students, operating expenses on the day to day operation and maintenance of the Training Center.

4.2. Offering Training

VTU shall offer to students at VTU's Training Center TC COURSES on the basis of the DIDACTIC CONCEPT of BRAG for the effective application and efficient use of machines, systems and facilities.

4.3. Trainers

The TC COURSES shall only be conducted by trainers who had been awarded the certificate of achievement (CoA) issued by BRAG (the "Certified Trainers) and VTU shall only engage Certified Trainers to conduct such courses at the Training Center.

VTU shall also ensure that each of the Certified Trainers shall undergo

a TTT course (defined in article 5.3 below) every 24 months after becoming a Certified Trainer.

4.4. Promotion

VTU shall actively cooperate with BRAG and BRIN in promoting the TC Courses and the Training Center in India.

4.5. Exclusive purchase and application of BRAG PRODUCTS

Due to the fact that BRAG provides a complete training and didactic system, based on specific know how, knowledge and experience and that the training center will bear the name of BRAG, it is of the utmost importance that VTU shall ensure that:

- all the PRODUCTS used in the TC Courses are purchased exclusively from BRIN or BRAG (BRIN will in turn purchase the PRODUCTS from BRAG).
- VTU shall only use the above mentioned PRODUCTS
- BRIN will maintain and/or repair the above mentioned PRODUCTS.

The compliance with the above provisions is of the essence of this Agreement.

ARTICLE 5 – RESPECTIVE OBLIGATIONS OF BRAG AND BRIN

5.1 Sale of PRODUCTS

BRAG shall supply BRIN or VTU the PRODUCTS to be used for implementing the DIDACTIC CONCEPT of BRAG. If required, BRIN will sell the PRODUCTS to VTU.

5.2 Willingness to conduct BRAG TTT COURSES in line with the MoU

BRAG shall offer VTU TTT COURSES within a period of one year from the date of this Agreement (MoA) for 2 trainees selected by VTU.

For these two trainees of VTU, no training course fees will be charged. The flight cost will be borne by VTU. The cost of accommodation will be borne by VTU. Trainees who have successfully completed the BRAG TTT COURSE will be awarded a CoA by BRAG.

5.3 Continuous provision of BRAG TTT COURSES

BRAG shall, within the framework of BRAG's TTT capacities, provide a TTT COURSE to any trainee sent by VTU in order to obtain a CoA. The same is valid for every Certified Trainer, who has completed 24 months of teaching in the VTU Training Center. BRAG shall be entitled to charge a nominal fee of € 2,000 (as may be adjusted by BRAG unilaterally from time to time upon prior notice to VTU) per trainee (the "TTT COURSE fee).

The TTT Fee in respect of each trainee shall be payable by VTU to BRAG in advance prior to the commencement of the TTT COURSE. VTU shall also bear the air ticket, accommodation and living expenses of each trainee.

For the avoidance of doubt, those Certified Trainers who fail to undergo the TTT COURSE shall be disqualified from conducting the TC COURSES.

5.4 Obligations of BRIN

BRIN hereby agrees to act as a consultant vis-à-vis VTU. Details thereof and any other cooperation or donation between BRIN and VTU are defined in a separate agreement and have to be in line with the MoA (Appendix 1).

ARTICLE 6 – TRADEMARKS AND PROMOTIONAL MATERIALS

6.1 Authorization

Subject to the confirmation of the terms and conditions by all contractual partners, BRAG hereby authorizes VTU to use the name

“Bosch Rexroth Training Partner”

for its Training Center upon its completion. The name may be used during the validity of this Agreement and according to the Corporate Design Guidelines for Training Partners of BRAG (Appendix 2).

6.2 Trademark

VTU shall not be authorized or granted the right to use the name “Bosch Rexroth”, “Bosch”, “Bosch Anchor”, “Rexroth” or any confusingly similar variation thereof and any other trademark or trade name of the Bosch Rexroth Corporation or its Affiliates except as expressly approved in writing by BR.

VTU may not use the Trademarks as part of, or in connection with VTU’s own name, trademarks, trade names or service marks.

6.3 Acknowledgements

By execution of this Agreement, VTU acknowledges that the Trademarks are the registered trademarks of BRAG. Nothing in this Agreement or in the course of performance under this Agreement shall confer on VTU an ownership interest in the Trademarks.

6.4 Limitation on Use

VTU’s use of the Trademarks in the name of Training Center hereunder shall be limited as follows: VTU’s use of the Trademark/tradename shall be: (a) in accordance with the shape, forms, style and color of the

Trademarks/tradename as communicated or authorized by BRAG and subject to BRAG's prior written approval. (b) in accordance with Appendix 2 (Corporate Design Guidelines for Training Partners of BRAG)

6.5 Promotional material

BRAG may from time to time at its discretion, provide to VTU catalogues and brochures, specifications and other current information required for the PRODUCTS of the DIDACTIC CONCEPT. The above mentioned promotional material can be supplied free of charge or subject to payment. for the Didactic Training System, some of which may be supplied free of charge and some at cost. VTU agrees to participate in promotional and advertising programs established by BRAG from time to time for the PRODUCTS.

ARTICLE 7 – TERMS OF PAYMENT

- 7.1. All payments shall be made in accordance with the terms and conditions as stipulated in the invoices issued by the respective Parties.
- 7.2. For the avoidance of doubt, all payments shall be made without any set off, counterclaim, restrictions or conditions and free and clear of and without deduction or withholding for or on account of any present or future tax, levies, charges and fees of any nature. In addition and without prejudice to any of the foregoing, each of the Parties further agrees not to withhold payment of any amount due to the other Parties on the grounds of the alleged non-performance or breach of any of the other Parties' obligations under this Agreement or any related agreement.

ARTICLE 8 – TERM OF AGREEMENT

This Agreement shall commence on the date of execution of this Agreement by the Parties and shall be valid for a period of 5 years. Thereafter, it shall automatically be extended for a further period of one 1 year unless sooner terminated by any Party giving at least six (6) month prior written notice to the other Parties or otherwise terminated under the provisions of this Agreement.

8.1. Termination Events

Each of the following events shall be a termination event (Termination Event“

- (a) A Party fails to pay to the other Party the whole or part of any sum due under this Agreement within thirty (30) days of the same becoming due.
- (b) Any Party fails to perform or comply with any of its obligations or undertakings under this Agreement.
Contractual obligations also include the obligation to make up for delays that can be made up for, or remedy failures that can be remedied, within fourteen (14) days (or such longer period as the other Party not at fault may approve) after receipt of written notice requiring it to do so.
- (c) Any representation or warranty made or deemed to be made by any Party hereunder proves to have been incorrect or misleading.
- (d) Any Party commits any act of bankruptcy or has been adjudicated bankrupt or makes any arrangement or composition with its respective creditors.
- (e) Any Party is dissolved or goes into liquidation.

- 8.2. If on of such Termination Events has occurred, any of the other Parties not at fault shall be entitled, but not obligated, to terminate this Agreement forthwith by giving notice of the same to the Party at fault.

ARTICLE 9 – INTELLECTUAL PROPERTY RIGHT

- 9.1. Save as provided in accordance with the provisions in this Agreement, nothing herein shall give or confer on VTU any right, title or interest in or to the DIDACTIC CONCEPT, TTT COURSES, the Teachware, Courseware, the TC COURSES, the TECHNOLOGY or any of the other intellectual property rights (IPR) of BRAG including, without limitation, patents, trademarks, copyrights, proprietary marks, names and designs (the “BRAG IPR) except in the manner and to the extent specifically envisaged under this Agreement.
- 9.2. VTU agrees that on expiration or termination of this Agreement, VTU shall cease to use any BRAG IPR and shall not thereafter use any trademarks, names or designs that may be confusingly similar to the BRAG IPR for any other purpose whatsoever.

ARTICLE 10 – CONFIDENTIAL INFORMATION

- 10.1. No information relating to this Agreement or its contents shall be disclosed to third parties during the term of this Agreement or after its termination. This is not valid, if
- (a) the prior written permission from all the Parties have been obtained
 - or
 - (b) such information becomes part of the public domain (other than by breach of this Agreement by any of the Parties).

- 10.2. This Article shall remain in full force and effect notwithstanding the termination of this Agreement for any reason whatsoever.

ARTICLE 11 – INTEGRATION OF AGREEMENTS

- 11.1. This Agreement constitutes the entire agreement between the Parties with reference to the subject matter of this Agreement and supersedes any and all prior negotiations, understandings, representations and agreements. The Parties acknowledge that they are entering into this Agreement as a result of their own independent investigation and not as a result of any representations made by any of the Parties which are contrary to the terms set forth in this Agreement or to any offering circular, prospectus, disclosure document or other similar document required or permitted to be given by any Party pursuant to applicable law.
- 11.2. This Agreement may not be amended orally, but may be amended only by a written instrument signed by the Parties. The Parties expressly acknowledge that no oral promises or declarations were made and that the obligations of the Parties are confined exclusively to the terms and conditions and the duration of this Agreement.

ARTICLE 12 – ASSIGNMENT

- 12.1. This Agreement is binding on and endure to the benefit of the successors in title and permitted assigns of the Parties.
- 12.2. Each of BRAG and BRIN are entitled to freely assign and transfer its respective rights and/or obligations under this Agreement at any time upon prior written notice to VTU, whereupon VTU shall execute such further documents as may be necessary to effect the same.
- 12.3. VTU shall not assign or transfer or create any charge or other security interest over any of its rights or obligations under this Agreement or at-

tempt to do any of the foregoing.

ARTICLE 13 – FORCE MAJEURE

- 13.1. Without prejudice to accrued liabilities and rights, none of the Party shall have any liability whatsoever to the other Parties or be deemed to be in default by reason of delay or failure in performance under this Agreement to the extent that such delay or failure is caused by or arises from acts or circumstance or events beyond the reasonable control of that Party, including but not limited to acts of god, acts or regulations of any governmental authority, war or national emergency, accident, fire, riot, strikes, lock-outs, industrial disputes, natural catastrophes or epidemics. Each Party shall bear its own losses arising from such force majeure event(s), if any.
- 13.2. Should such force majeure continue to persist for more than three (3) months, this Agreement shall automatically terminate.

ARTICLE 14 – SEVERABILITY

If any term or provision of this Agreement is to any extent held by a court or other tribunal to be invalid, void or unenforceable, insofar as it is in conflict with the law, the remaining rights and obligations of the Parties will be construed and enforced as if this Agreement did not contain the particular terms or provision held to be invalid, void or unenforceable.

ARTICLE 15 – LANGUAGE AND COUNTERPARTS

This Agreement shall be executed in English. However, in the event of any dispute or difference between the Parties in respect of the interpretation of this Agreement or the rights and liabilities of any Party or in

respect of anything done or omitted to be done or omitted hereunder, then for the avoidance of doubt, it is expressly agreed by the Parties hereto that the Agreement executed in the English language shall prevail.

ARTICLE 16- NOTICE

- 16.1. Any notice required or permitted to be given by any Party to the other Parties under this Agreement shall be in writing addressed to the other Parties at the addresses stated above or such other address as may at the relevant time have been notified pursuant to this provision to the Party giving the same.
- 16.2. All notices, demand or communication to be given or delivered pursuant to or otherwise in relation to this Agreement shall be in the English language or to be accompanied by a translation from a certified English translator.

ARTICLE 17 – NO WAIVER

- 17.1. No delay, omission or failure to exercise any right or remedy provided for herein shall be deemed to be a waiver thereof or acquiescence in the event giving rise to such right or remedy nor shall any partial exercise of any such right preclude the exercise of any other right. Every right on remedy may be exercised from time to time and so often as may be deemed expedient by the Party exercising such right or remedy.
- 17.2. Any waiver on consent given by any Party under this Agreement shall be in writing and may be given subject to any conditions as that Party may impose. Any waiver on consent shall be effective only for that instance and for the purpose for which it is given.

ARTICLE 18 – GENERAL PROVISIONS

- 18.1. The Parties are not joint ventures partners and have no other relationship other than independent contracting parties. Each of the Parties agrees that neither has the power to bind or obligate the other in any manner, other than as is expressly set forth in this Agreement.
- 18.2. Unless the context otherwise requires, words importing the singular number also shall include the plural and vice versa; words importing the masculine gender also shall include the feminine or any neuter genders and vice versa; and words importing persons also shall include firms and corporations and vice versa. Whenever in this Agreement the words “includes“, “including“ or “inclusive“ or the phrase “and in particular“ shall appear, these words shall in all cases be interpreted and construed so as not to limit the generality of the words of general application or nature which precede those words when used herein. References to this Agreement or any other document referred to herein shall include references to such document as the same may be amended or supplemented from time to time. The words “hereof“, “herein“ and “hereunder“ and other words of similar import used in this Agreement refer to this Agreement as a whole and shall not in any way affect the interpretation of this Agreement.
- 18.3. The titles and subtitles of the various Articles of this Agreement are inserted for convenience and will not affect the meaning or construction of any of the terms, provisions, covenants and conditions of this Agreement.
- 18.4. The Parties agree to execute in good faith all other documents and perform all further acts necessary and desirable to carry out the purposes of this Agreement.

ARTICLE 19 – GOVERNING LAW

This Agreement shall be governed by and construed in accordance with the laws of the Federal Republic of Germany.

ARTICLE 20 – ARBITRATION (COURT OF ARBITRATION)

20.1. All disputes arising in connection with the present contract shall be finally settled under the Rules of Conciliation and Arbitration of the International Chamber of Commerce, Paris, by one or more arbitrators appointed in accordance with the said Rules. Arbitration shall take place in Frankfurt, Germany.

The decision award shall be final and binding for both Parties.


This AGREEMENT has been made in the English language in three original copies.

IN WITNESS WHEREOF the Parties have executed this Agreement on the date first written above.

for BRAG

for BRIN

for VTU



.....
Dr. Lutz Zimmermann

.....
V.K. Viswanathan

.....
Prof. M.S. Shivakumar

Executive Vice President
Sales Industrial Hydraulics

Director BRIN

Registrar VTU

.....
27-10-2005

.....
DD.MM.YY

.....
DD.MM.YY

.....
DD.MM.YY



.....
Uwe Freyer

.....
Santosh Kelshikar

.....
Dr. Gouri L. Shekar

Franchise Training Center

Didactics & Training

Professor and Special
Officer

.....
27/10/05

.....
27.10.2005

.....
DD.MM.YY

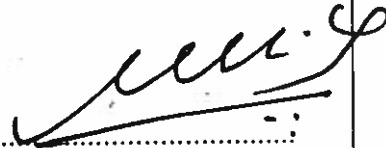
.....
DD.MM.YY

.....
DD.MM.YY

for BRAG

for BRIN

for VTU



Dr. Lutz Zimmermann

V.K. Viswanathan

Prof. M.S. Shivakumar

Executive Vice President
Sales Industrial Hydraulics

Director BRIN


Registrar VTU

27-10-2005

DD.MM.YY

DD.MM.YY

DD.MM.YY



Uwe Freyer

Santosh Kelshikar

Dr. Gouri L. Shekar

Franchise Training Center Didactics & Training

Professor and Special
Officer

27/10/05

27.10.2005

DD.MM.YY

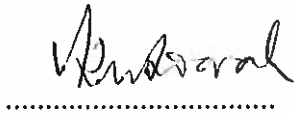
DD.MM.YY

DD.MM.YY

for BRAG

for BRIN

for VTU



Dr. Lutz Zimmermann

V.K. Viswanathan

Prof. M.S. Shivakumar

Executive Vice President
Sales Industrial Hydraulics

Director BRIN

Registrar VTU

27.01.06

.....

27-10-2005

DD.MM.YY

DD.MM.YY

DD.MM.YY



Uwe Freyer

Santosh Kelshikar

Dr. Gouri L. Shekar

Franchise Training Center

Didactics & Training

Professor and Special
Officer

27/10/05

27/10/05

27.10.2005

DD.MM.YY

DD.MM.YY

DD.MM.YY

APPENDIX

Appendix 1: All valid sales catalogues released through BRAG; Hardware, Teachware, Courseware, Components, Systems, Services and Rights of Use, as published in the valid sales catalog of Training & Didactic by BRAG; more details are to be specified in given quotation or in the license contracts.

Appendix 2: Guidelines of Corporate Design for Training Partners of BRAG
“ZNZ-00311-001_NOR_N_D0_2004-06-04”

Appendix 3: Special agreement between BRIN and VTU

Appendix 3

This Appendix is dated on the 14th day of May 2006 and rules the obligations from BRIN towards VTU. All mentioned obligations as listed below come into force in line with a valid order income at BRAG based on quotation US15-0403-7837-B VTU-BRTC dated May 14th 2006. Any services asked prior to the order placement will be refused by both parties BRIN and BRAG.

Obligations as such:

- Assembling, Installation and Introduction of Training Systems at the VTU Training Center in Mysore, India without any charges towards VTU.
- Provision of Teachware-licences for the laboratories as listed in quotation US15-0403-7837-B VTU-BRTC dated May 14th 2006
- Support in Application Training if requested by VTU to conduct industrial training groups. Fees for the trainer have to be negotiated separately.
- Access for BRIN to the Training Center and training rooms of VTU is highly welcome by VTU for BRIN to conduct training to industries. Fees are not charged by VTU towards BRIN whereas access is defined by booking schedule of VTU.



S.G. Kelshikar
Head Didactics, BRIN

15th May 06

DD.MM.YY



Prof. M.S. Shivakumar
Registrar VTU

15/5/06

DD.MM.YY

Minutes of Meeting held in Belgaum in connection with VTU-BR International Training Institute on 15th May 06

Present

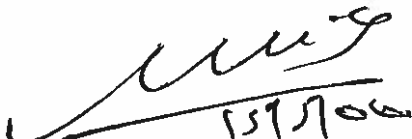
For VTU

1. Dr. M. S. Shivakumar Registrar
2. Dr. G.L.Shekar Special officer
3. Dr. N.V.Raghavendra

For Bosch Rexroth

1. Mr. Uwe Freyer BR AG
2. Mr. S. G. Kelshikar BRIL

1. Further to the meeting held in Mysore, for site visit and subsequent meeting of Implementation committee on 14th May, meeting was held in Belgaum on 15th May 2006 to formalize the ordering process for the equipment. Following was discussed,
2. Registrar was appraised of the discussions held in Mysore and the plan drawn by VC to implement the project before Dec 06.
3. The specification of equipment and the budget for first phase of implementation namely Hydraulic, Pneumatic and Sensoric Laboratories was handed over to registrar for his further needful.
4. Registrar informed that he will take up the issue of change of location of training centre to Mysore in the next EC meeting due on 29th May. The papers will be processed within 2 weeks for establishing Letter of Credit (LC) on bank approved by German banks.
5. BR-AG confirmed that proforma invoice will be provided to registrar within one week of confirmation by VTU.



15/5/06

Dr. M. S. Shivakumar

Registrar – VTU, Belgaum



15/5/06

Mr. Uwe Freyer

Head-Franchise Training centre
BR-AG