NOMINATION FORM FOR OUTSTANDING MASTER'S GRADUATE

COLLEGE OF ENGINEERING AND COMPUTING
SUMMER 2015

PURPOSE

The Outstanding Master and Doctoral Graduates are selected through a college wide competition. This award recognizes a student's academic **EXCELLENCY** and ***EXEMPLARY SERVICE*** to his or her department while pursuing his/her degree.

- The **Outstanding M.S. Graduate Award** is presented to one student.
- The faculty of each department chooses a **nominee** for each major at the Master's level.
- There may not be a nominee for each major every semester.
- There may not be a winner every semester.

CRITERIA

An **Outstanding M.S. Graduate** is a student with at least a 3.5 GPA **AND** has been very active in his/her

- Quality & Impact of research, including publications, patents, awards, and scholarships in national and international conferences, in journals, trade magazines, and similar forums. **The publications should be limited to those produce while at FIU.**
- Presentations at conferences: research presentations at national or international meetings. **The presentations should be limited to those made while at FIU.**
- Professional societies: an officer, or a very active member not just a member;
- Departmental activities: has supported the department activities such as E-Week Activities, represented the department in E-Week Activities at the college level, part of recruitment team / visits to High schools, technical competitions, and so forth.
- College activities: part of the Ambassadors Team, the recruitment team, etc.
- Local community: Mentoring, habitat for Humanity, etc.
- Mentorship to undergraduate students: has been an active mentor to one or more undergraduate students, or has mentored high school students.

The Graduate Program Directors and Associate Dean for Graduate Studies will evaluate the student's achievement under the framework of the **duties assigned**, and realizing that these nominees are Graduate students who are expected to have a high GPA. The **distinguishing traits reside in the professional production and the service**.

At the ceremony, an excerpt of the student's accomplishments will be read based on the

1. Nominator Additional Comments, and
2. Letter of support from department chair

CHECK LIST FOR NOMINATOR

	Part A Completed
	Part B Completed
	Nominator's Additional Comments (optional)
	Part C Completed
	Copy of students unofficial transcripts
	Letter of support from department chair
	Student will graduate this semester
	Student will be present at the ceremony

Return all materials, by email, to: Dr. Kang Yen at yenk@fiu.edu and cc Ms. Laura Gim enez at gimenezl@fiu.edu

Nomination Form Outstanding Master Graduate

COLLEGE OF ENGINEERING AND COMPUTING

Student Name: Sohail Reddy Panther ID: 3217850

FIU Graduate GPA: 4.00 (GPA ≥ 3.5) Email: sredd001@fiu.edu

Department:
- [ ] Biomedical
- [ ] Electrical & Computer
- [ ] Civil & Environmental
- [x] Mechanical & Materials
- [ ] Construction Management
- [ ] SCIS

Program:
- [ ] Engineering Management

Major: Master of Science in

- [ ] Biomedical (BME)
- [ ] Construction Mngmt (CM)
- [ ] Information Technology (IT)
- [ ] Civil (CE)
- [ ] Electrical (EE)
- [ ] Materials (Mat)
- [ ] Computer Engr (CpE)
- [ ] Enginr. Management (EM)
- [x] Mechanical (ME)
- [ ] Computer Science (CS)
- [ ] Environmental (EnvE)
- [ ] Telecommunications (TCN)

PART A: Thesis / Project Work

Thesis / Project Title: Multi-Objective Analysis and Optimization of Integrated Cooling in Micro-Electronics with Hot Spots

Major Professor: George S. Dulikravich

Thesis / Project Abstract: Multi-Objective Optimization of Micro-Pin fin Arrays for Cooling of High Heat Flux Electronics (M.Sc Thesis)

Electronic chips or Integrated Circuits (ICs) are implemented in everyday devices such as cell phones, computers, printers, cameras, TVs and many more. Although invisible to the naked eye, the users are very well aware of the capabilities of the electronics within their devices, but what they are not aware of are the elevated temperatures of those chips. With the demand of computing power from electronic chips on a constant rise, the heat produced is rapidly increasing. The thermal energy levels can increase enough to cause complete failure of the electronic chips. Proper design of the thermal management technology will allow for the ICs to reach much higher level of performance. This performance of ICs is directly proportional to the heat flux resulting from them. Thus, higher computing performance leads to higher temperatures, which directly leads to structural degradation. Therefore, an efficient method is needed to cool

the ICs and an effective technique is needed to find such a configuration that is able to cool the IC. Electronic chips of today output a heat flux of about 100 W/cm2. In most applications the heat flux distribution in these chips is not uniform; they feature hot spots where the heat flux is an order of magnitude higher. This poses a great deal of challenge, as the heat flux level is both higher and nonuniformly

distributed over the chip. The nonuniform temperature distribution results in higher temperature gradients which then result in increased thermal stresses. Integrated circuits are believed to be the best way to provide opportunity for higher performance computing in the semiconductor industry.

The heat flux in next generation chips is predicted to reach 500 W/cm2 at the background and in excess of 1000 W/cm2 at the hot spots. This significantly increases the temperatures and therefore the thermal loads on the electronic chips. The increase in thermal loads normally requires increased coolant flow rate, thereby increasing the coolant pumping power demand and hydrodynamic loads on the cooled configuration.

Most methods of controlling the rise in temperature, such as microchannels and microjets, employforced convection to remove heat from the IC. Forced convection is the transfer of heat between two
relatively moving media when one of the media is moving due to externally applied force. This method requires fluid such as air, water or a refrigerant, to be pumped through the IC geometry to remove the heat. Forced convection adds another parameter to be considered when cooling electronics, the pumping power required to pump the fluid.
Although microchannel and microjet do not pose manufacturing difficulties, they do not allow for compact packaging of the IC. As electronic chips decrease in size, more compact configurations are needed. In today's semiconductor industry, this is overcome by using micro-pin fins. Micro-pin fin arrays not only act as heat sinks, carrying heat via conduction away from the heated surface, but also allow for interconnection between stacked layers of chips. This is due the copper vias, referred to as Through-Silicon Vias (TSVs), housed inside of the silicon pin fins. The more commonly implemented pin fin configurations feature a circular cross-section. Analysis showed that circular crosssection leads to flow separation and creates a recirculation region behind the pin fins. This separation reduces heat transfer and increases the temperatures in this region. Two proposed micro-pin fin shapes, airfoil and convex, have shown to eliminate this flow separation thereby decreasing the maximum temperature. These two designs have also shown to reduce pumping power required to pump the coolant.
The thermal loads considered in this work are beyond those of the next generation chips. A background heat flux of 500 W/cm2 at the background and a hot spot heat flux of 2000 W/cm2 were applied. Conjugate heat transfer analysis was performed on each micro-pin fin configurations using the finite volume solver, ANSYS Fluent.
A multi-objective optimization was performed on three micro-pin fin shapes were optimized to reduce maximum temperature and pumping power. The results showed that the optimized configurations of the three shapes are able to contain heat fluxes beyond those next generation chips while keeping the maximum temperature below a specified threshold.
A stress-deformation analysis, incorporating hydrodynamic and thermal loads, showed that the maximum Von-Mises stress is significantly less than the yield strength of Silicon thereby indicating structural integrity.
A novel inverse design approach presented allows for the design of electronic cooling configurations without a prior knowledge of the thermal mapping. This is an inverse design problem that was solved using a constrained multi-objective optimization technique. The inverse design approach allowed for design of cooling configuration capable of cooling a background heat flux of 760 W/cm2 and a hot spot heat flux of 2540 W/cm2; that is almost twice that of the next generation chips.
To further reduce the temperatures of the electronic cooling configurations, thin film coatings were investigated. Diamond and Graphene Nano-Platelets coating were applied to dissipate the heat away from the hotspot, thereby reducing maximum temperatures. The thin film coatings of both materials have shown to reduce maximum temperature by 30oC while improving temperature uniformity, resulting in lower thermal stresses.
Various configurations have been optimized to cooling electronic chips producing heat fluxes beyond those of next generation chips. An inverse design approach has shown that a further increase in heat flux, and therefore performance, is possible without compromising cooling efficiency and structural integrity. Implementation of thin film coatings have shown to be a cost effective method to further reduce maximum temperature and improve temperature uniformity

PART B: Student's Curricular and Extracurricular Activities

Provide the following information:
Student work in regards to

1. Publications: **(limited to those produce while at FIU).**

Conference

- ***Winglets – Multi-Objective Optimization of Aerodynamic Shapes,** S.R. Reddy, H. Sobieczky, A. Abdoli, G.S. Dulikravich, *11th World Congress of Computational Mechanics – WCCM XI,* Barcelona, Spain, July 20-25, 2014. (Peer Reviewed)
- **Multi-Winglets: Multi-Objective Optimization of Aerodynamic Shapes,** S.R. Reddy, G.S.Dulikravich, A. Abdoli, H. Sobieczky, *53rd AIAA Aerospace Sciences Meeting,* Kissimmee, Paper AIAA-2015-1489, Florida, USA, January 8 2015
- **Inverse Parameter Identification Using Bayesian Statistics and Response Surfaces,** C. Pacheco, M. Vesenjak, R. Jha, S.R. Reddy, G.S. Dulikravich, H.B. Orlande, *4th International Conference on Material Modeling,* Berkley, California, USA, May 27-29, 2015.
- **Inverse Design of Cooling of Electronic Chips Subject to Specified Hot Spot**
- **Temperature and Coolant Inlet Temperature,** S.R. Reddy and G.S. Dulikravich, *ASME 12th International Conference on Nanochannels, Microchannels, and Minichannels*, San Francisco, California, USA, July 6-10, 2015
- **Multi-Objective Optimization of Micro-Pin Fin Arrangements for Cooling of High Heat Flux Electronics With a Hotspot,** S.R. Reddy, A. Abdoli, G.S. Dulikravich, C. Pacheco, G. Vasquez, R. Jha, M.J. Colaco and H.R.B. Orlande, *ASME 12th International Conference on Nanochannels, Microchannels, and Minichannels,* San Francisco, California, USA, July 6-10, 2015
- **Conjugate Analysis of Thin Film Heat Spreaders to Reduce Temperature at Hot Spots,** S.R. Reddy, A. Abdoli, G.S. Dulkravich and R. Jha, *ASME IMECE,* Houston, TX, November 13-19, 2015
- **Multi-Objective Optimization of Micro-Pin Fin Arrangements for Cooling of High Heat Flux Electronics,** S.R. Reddy and G.S. Dulkravich, *ASME IMECE,* Houston, TX, November 13-19, 2015
- **Inverse Determination of Spatial Variation of Diffusion Coefficients in Arbitrary Objects Creating Desired Non-Isotropy of Field Variables,** G.S.Dulikravich, S.R. Reddy, M.J. Colaco, H.R.B. Orlande, *Material Science & Technology 2015,* Columbus, OH, USA, October 4-8, 2015
- **Identification of Material Properties Through a Markov Chain Monte Carlo Technique and a Response Surface Approximation,** C.C. Pacheco, M. Vesenjak, M. Borovinsek, I. Duarte, R. Jha, S.R. Reddy, G.S. Dulikravich, H.R.B. Orlande and M.J. Colaco, *23rd ABCM Interntional Congress of Mechanical Engineering COBEM2015,* Rio de Janeiro, Brazil, December 6-11, 2015

Journal

- **Multi-Winglets: Multi-Objective Optimization of Aerodynamic Shapes**, S.R. Reddy, H. Sobieczky, G.S. Dulikravich and A. Abdoli, *Journal of Aircraft (in review)*
- **Inverse Determination of Spatially Varying Material Coefficients in Solid Objects,** G.S. Dulikravich, M.A.Pasqualette, S.R. Reddy, M.J. Colaco and H.R.B. Orlande, *Journal of Inverse and Ill-Posed Problems (Invited Paper-in review)*
- **Conjugate Analysis of Thin Film Heat Spreaders to Reduce Temperature at Hot Spots,** S.R. Reddy, A. Abdoli, G.S. Dulkravich and R. Jha (*Submitted to Int. Journal of Thermal Sciences)*
- **Multi-Objective Optimization of Micro-Pin Fin Arrangements for Cooling of Electronic Devices With a Hotspot,** S.R. Reddy, A. Abdoli, G.S. Dulikravich, C. Pacheco, G. Vasquez, R. Jha, M.J. Colaco and H.R.B. Orlande (*Submitted to the ASME Journal of Heat Transfer)*

- **Inverse Design of Cooling of Electronic Chips Subject to Specified Hot Spot Temperature and Coolant Inlet Temperature,** S.R. Reddy and G.S. Dulikravich (*Submitted to the Numerical Heat Transfer: Part A)*
- **Conjugate Analysis of Thin Film Heat Spreaders to Reduce Temperature at Hot Spots,** (*submitted to International Journal of Thermal Sciences*).

2. Presentations at conferences: (**limited to those made while at FIU).**
- Innovative Design Simulation Challenge at 2014 ASME IDETC/CIE/AM3D, Buffalo, NY
- 53rd AIAA Aerospace Sciences Meeting, SCITECH2015, Orlando, FL

3. Mentorship to undergraduate students (list name of students mentored)
- Genesis Vasquez
- Alfred Salas
- Daniel Pena
- Joe Coverston
- Andres Cardenas
- Arjav Patel
- Nestor Paz
- Xavier Medina
- Fernando Lopez
- Gianfranco Pisani

Undergraduate Thesis mentorship:
- . **Multi-Objective Optimization of Radial Compressor**, Xavier Medina, Fernando Lopez, and
- Gianfranco Pisani
- . **Nano-Launch Reaction Control System,** David Dominquez, Gianni Jimenez and Genesis
- Vasquez
- . **SAE Brazil Aero-Design Competition,** Andres Cardenas, Arjav Patel and Nestor Paz

4. Duties assigned: as part of RA
- Perform research for DARPA's ICECool Project
- Assist lab members in numerical analysis, optimization and HPC
- Prepare progress reports
- Carry out software maintenance on MAIDROC's HPC Cluster
- Supervise undergraduate research performed in the lab
- Guide senior design teams under the guidance of Prof. Dulikravich in performing their research

5. Honor & Awards
- ASME – " Best Overall Impact Simulation Award" at 2014 Innovative Design Simulation Challenge student competition
- ASME – Finalist in 2015 Innovative Design Simulation Challenge student competition (set to compete August 2nd 2015)
- Tau Beta Pi Engineering Honor Society – E. board
- Florida International University – Presidential Fellowship

6. Fellowship & Scholarships
- Florida International University – Presidential Fellowship

Student involvement in

7. Professional societies
- Tau Beta Pi Engineering Honor Society – E. Board
- American Institute of Aeronautics and Astronautics (AIAA) – Student Member

8. Departmental activities
- Florida International University Engineering Expo Tour Guide
- Student Ambassador for MME Dept. for College of Engineering and Computing

9. College activities
- Tau Kappa Epsilon International Fraternity Inc. – Vice President 2012-2013

10. Local community
Nominator Additional Comments (preferably the Major Professor)
I am very happy to recommend to you Mr. Sohail Reddy, one of my outstanding student assistants. I have known him since January of 2013 when he enrolled in my demanding EML3126 Transport Phenomena course in which he excelled. His hard work and dedication to life-long learning and constant search for improvement has enabled him to excel in both academics and research. As he developed his research skills, he broadened his scope of work into the fields of optimization, metamodels, electrogasdynamics and microelectronics cooling. Mr. Reddy has also learned how to use modeFrontier multi-objective design optimization and has performed valuable research on comparative analysis of several most popular response surface generation algorithms.

He has turned the work in his senior thesis into conference papers and award winning design. Specifically, in August of 2014, Sohail participated in American Society of Mechanical Engineer's inaugural Innovate Design and Simulation Challenge students' competition. Here, he had the opportunity to represent his research performed in my MAIDROC laboratory and Florida International University in front of participants from around the globe including representatives from institutions such as Georgia Institute of Technology and Indian Institute of Technology. His innovative airplane winglet shape design optimization grabbed the attention of faculty and student competitors from various schools and increased their interest in FIU and in his skills. His presentation at this competition won him the "Best Overall Impact Simulation" award.

Mr. Reddy is a highly enthusiastic, cheerful and very quick-minded and creative student with excellent presentation skills. I also want to point out that Mr. Reddy has been working several jobs to put himself through college. His graduate GPA is impeccable and he has been tutoring several undergraduate research assistants in my MAIDROC lab. He is also the recipient of the FIU Presidential Graduate Fellowship that will cover his Ph.D. program starting this August.

In summary, I recommend Mr. Sohail R. Reddy to you most highly for the Best M.Sc. Student Award in CEC.

11. Additional Comments: unique stories, special situation that makes the students accomplishment even more remarkable.

PART C: Additional Documentation

Attach a:
1. Copy of students unofficial transcripts
2. Letter of support from department chair

PART D: Electronic Submission

- PDF file of this completed **form**.
- PDF of **Letter of support from Department Chair**
- Electronic version of **Transcripts** (PDF or JPG)

UGRD and GRAD Record Unofficial

Name : Sohail Reddy

Student ID: 3217850

Address : 7950 SW 22nd Street

Miami, FL 33155-6516

United States

Print Date : 2015-07-06

- - - - - **Degrees Awarded** - - - - -

Degree : Bachelor of Science

Confer Date : 2014-08-09

Plan : Mechanical Engineering

- - - - - **Test Credits** - - - - -

Test Credits Applied Toward Engineering Program

FALL 2010

MAC	2311	Calculus I	
4.00	4.00 TR		
PSY	2012	Intro To Psychology	
3.00	3.00 TR		
	Test Trans GPA:	0.000	Transfer Totals :
7.00	7.00	0.000	

Florida International University

- - - - - **Beginning of Undergraduate Record** - - - - -

FALL 2010

Program : Engineering

Plan : Pre-Mechanical Engineering-BS Pre-Major

ECO	2023	Principles Microeco	
3.00	3.00 C	6.000	
ENC	1101	Writing and Rhetoric I	
3.00	3.00 B	9.000	
GEA	2000	Wrld Regional Geogra	
3.00	3.00 C+	6.990	
PHY	2048	Physics W/Calculus I	
4.00	4.00 B-	10.680	
PHY	2048L	General Phys Lab I	
1.00	1.00 A	4.000	
SLS	1501	First Year Exper	
1.00	1.00 A	4.000	
	TERM GPA :	2.710	TERM TOTALS :
15.00	15.00	40.670	
	CUM GPA :	2.710	CUM TOTALS :
15.00	22.00	40.670	

SPR 2011

Program : Engineering

Plan : Pre-Mechanical Engineering-BS Pre-Major

CHM	1045	Gen Chemistry I	
3.00	3.00 A	12.000	
CHM	1045L	Gen Chem Lab I	
1.00	1.00 B	3.000	
EGN	1100	Intro To Engineering	
2.00	2.00 A-	7.340	
ENC	1102	Writing and Rhetoric II	
3.00	3.00 B	9.000	
MAC	2312	Calculus II	
4.00	4.00 A-	14.680	
MUH	2116	Evolution Of Jazz	
3.00	3.00 A	12.000	
PHY	3012	Seminar Physics Ed	
1.00	1.00 A	4.000	
	TERM GPA :	3.650	TERM TOTALS :
17.00	17.00	62.020	
	CUM GPA :	3.210	CUM TOTALS :
32.00	39.00	102.690	
		** Dean's List **	

FALL 2011

Program : Engineering

Plan : Pre-Mechanical Engineering-BS Pre-Major

AMH	2041	Origins Amer Civ	
3.00	3.00 A-	11.010	
EGN	1033	Tech, Humans and Soc	
3.00	3.00 A	12.000	
EUH	2030	West Civ: Mod/Eur	
3.00	3.00 B+	9.990	
MAC	2313	Multivariable Calc	
4.00	4.00 A	16.000	
PHY	2049	Physics W/Calc II	
4.00	4.00 A	16.000	
PHY	2049L	General Phys Lab II	
1.00	1.00 A	4.000	
	TERM GPA :	3.830	TERM TOTALS :
18.00	18.00	69.000	
	CUM GPA :	3.430	CUM TOTALS :
50.00	57.00	171.690	
		** Dean's List **	

SPR 2012

Program : Engineering

Plan : Pre-Mechanical Engineering-BS Pre-Major

EGN	3311	Statics	
3.00	3.00 C	6.000	
EGN	3343	Thermodynamics I	
3.00	3.00 B	9.000	
EGN	3365	Materials Eng	
3.00	3.00 B-	8.010	
EML	2032	Programming for ME	
3.00	3.00 B-	8.010	
MAP	2302	Differential Equat	
3.00	3.00 B-	8.010	
	TERM GPA :	2.600	TERM TOTALS :
15.00	15.00	39.030	
	CUM GPA :	3.240	CUM TOTALS :
65.00	72.00	210.720	

FALL 2012

Program : Engineering

Plan : Mechanical Engineering - BS Major

EEL	3110	Circuit Analysis	
3.00	3.00 B	9.000	
EEL	3110L	Circuits Lab	
1.00	1.00 A	4.000	
EGM	3311	Analysis Eng Syst	
3.00	3.00 A	12.000	
EGN	3321	Dynamics	
3.00	3.00 C	6.000	
EMA	3702	Mech & Mat Science	
3.00	3.00 B	9.000	
EML	1533	Intro to CAD for ME	
3.00	3.00 C	6.000	
	TERM GPA :	2.880	TERM TOTALS :
16.00	16.00	46.000	
	CUM GPA :	3.170	CUM TOTALS :
81.00	88.00	256.720	

SPR 2013

Program : Engineering

Plan : Mechanical Engineering - BS Major

EGN	3613	Engineering Economy
3.00	3.00 B	9.000
EIN	3390	Manuf Processes
2.00	2.00 C+	4.660
EIN	3390L	Manuf Processes Lab
1.00	1.00 A-	3.670
EMA	3702L	Mech & Mat Sci Lab
1.00	1.00 B	3.000
EML	3126	Transp Phenon
3.00	3.00 B+	9.990

EML	3500		Mech Design I		
3.00	3.00	C+	6.990		
EML	4804		Intro Mechatronics		
3.00	3.00	C+	6.990		
	TERM GPA :		2.770	TERM TOTALS :	
16.00	16.00		44.300		
	CUM GPA :		3.100	CUM TOTALS :	
97.00	104.00		301.020		

SUM 2013

Program : Engineering

Plan : Mechanical Engineering - BS Major

EML	4911		UG Research Exp		
3.00	3.00	A	12.000		
EML	3036		Simultn Software ME		
3.00	3.00	A	12.000		
EML	4601		Princ Refr Air Cond		
3.00	3.00	A	12.000		
EML	4906L		Mech Lab I		
1.00	1.00	A-	3.670		
	TERM GPA :		3.970	TERM TOTALS :	
10.00	10.00		39.670		
	CUM GPA :		3.180	CUM TOTALS :	
107.00	114.00		340.690		
			** Dean's List **		

FALL 2013

Program : Engineering

Plan : Mechanical Engineering - BS Major

EAS	4200		Intr Design Anal Aer Str		
3.00	3.00	A	12.000		
EML	3222		Systems Dynamics		
3.00	0.00	D			
Repeated : Exclude Repeat - No Credit					
EML	3301L		Instrumentation Lab		
1.00	1.00	B	3.000		
EML	4140		Heat Transfer		
3.00	3.00	C+	6.990		
EML	4501		Mech Design II		
3.00	3.00	C	6.000		
EML	4551		Ethics Dsn Proj Org		
1.00	1.00	A-	3.670		
EML	4806		Modeling Of Robots		
3.00	3.00	B	9.000		
	TERM GPA :		2.570	TERM TOTALS :	
17.00	14.00		43.660		

CUM GPA : 3.100 CUM TOTALS :
124.00 128.00 384.350

SPR 2014

Program : Engineering

Plan : Mechanical Engineering - BS Major

EGM 5354 Fem In Me
3.00 3.00 A 12.000
EML 3126L Transp Pheno Lab
1.00 1.00 A 4.000
EML 4706 Des Therm Fluid Sys
3.00 3.00 B 9.000
EML 4905 Senior Design Proj
3.00 3.00 A 12.000
EML 5509 Optimization
3.00 3.00 A 12.000
TERM GPA : 3.770 TERM TOTALS :
13.00 13.00 49.000

CUM GPA : 3.160 CUM TOTALS :
137.00 141.00 433.350
** Dean's List **

SUM 2014

Program : Engineering

Plan : Mechanical Engineering - BS Major

EML 3222 Systems Dynamics
3.00 3.00 A 12.000
Repeated : Include Repeat

TERM GPA : 4.000 TERM TOTALS :
3.00 3.00 12.000

CUM GPA : 3.180 CUM TOTALS :
140.00 144.00 445.350
Undergraduate Career Totals

CUM GPA : 3.180 CUM TOTALS :
140.00 144.00 445.350
- - - - - **Non-Course Milestones** - - - -
Summer Enrollment Requirement - Completed

Milestone Status: Completed

9 or more Hours of University Summer Attendance
Foreign Language Requirement - Exempted - high school credit
Milestone Status: Completed

Satisfied with High School Course Work 00/00

UGRD and GRAD Record Unofficial

Name : Sohail Reddy

Student ID: 3217850

Address : 7950 SW 22nd Street

Miami, FL 33155-6516

United States

Print Date : 2015-07-06

- - - - - Degrees Awarded - - - - -

Degree : Bachelor of Science

Confer Date : 2014-08-09

Plan : Mechanical Engineering

Florida International University

- - - - - Transfer Credits - - - - -

Transfer Credit from Florida International University

Applied Toward Engineering Program

FALL 2014

EGM	5354	Fem In Me	
3.00	3.00 A	12.000	
Repeated	: Repeated for Credit with Advisor Approval		
EML	5509	Optimization	
3.00	3.00 A	12.000	
Repeated	: Repeated for Credit with Advisor Approval		
Course Trans GPA:	4.000	Transfer Totals :	
6.00	6.00	24.000	

- - - - - Beginning of Graduate Record - - - - -

FALL 2014

Program : Engineering

Plan : Mechanical Engineering - MS Major

EGM	6355	Nonlinear Fea	
3.00	3.00 A	12.000	
EML	5709	Int. Fluid Mech.	
3.00	3.00 A	12.000	
EML	6155	Conv Heat Transfer	
3.00	3.00 A	12.000	
TERM GPA :	4.000	TERM TOTALS :	
9.00	9.00	36.000	

CUM GPA : 4.000 CUM TOTALS :
15.00 15.00 60.000
Good Standing

SPR 2015

Program : Engineering

Plan : Mechanical Engineering - MS Major

EGM 5315 Int Anal Mech Syst
3.00 3.00 A 12.000
EML 6153 Adv Heat Transfer
3.00 3.00 A 12.000
EML 6725 Comp. Fluid Dynamics
3.00 3.00 A 12.000
EML 6935 Graduate Seminar
0.00 P
Grading Basis: Pass/Fail

TERM GPA : 4.000 TERM TOTALS :
9.00 9.00 36.000

CUM GPA : 4.000 CUM TOTALS :
24.00 24.00 96.000
Good Standing

SUM 2015

Program : Engineering

Plan : Mechanical Engineering - MS Major

EML 6971 Masters Thesis
6.00

TERM GPA : 0.000 TERM TOTALS :
0.00 0.00 0.000

CUM GPA : 4.000 CUM TOTALS :
24.00 24.00 96.000

Graduate Career Totals

CUM GPA : 4.000
CUM TOTALS : 24.00 24.00
96.000

FIU | Engineering and Computing
FLORIDA INTERNATIONAL UNIVERSITY

July 6, 2015

Graduating Student Award Committee
College of Engineering and Computing
Florida International University
Miami, FL, 33174

Ref: Nomination of Soheil Reddy as Outstanding Graduating Student (M.S.)

Dear Award Committee members,

I am pleased to nominate Mr. Soheil Reddy for the Outstanding Graduating Student (M.S.) for the Summer 2015 ceremony.

Soheil started his MS program in the Department of Mechanical and Materials Engineering in Fall 2014 as part of the BS/MS program and will be completing the requirements for the degree in Mechanical Engineering in the Summer 2015, with a GPA of 4.0 under the tutelage of Prof. George S. Dulikravich.

For his MS thesis, he studied Multi-Objective Optimization of Micro-Pin Fin Arrays for Cooling of High Heat Flux Electronics.

Specifically he:
• Investigated the ability of various electronic cooling configurations in handling high heat fluxes (2000 W/cm^2)
• Developed and optimized two novel electronic cooling configurations much superior than ones currently implemented
• Used parallel and high performance computing to reduce simulation times
• Investigated the use of diamond coating to increase conduction and further reduce electronic chip temperature
• Formulated a coupled fluid flow, heat transfer, electric field, magnetic field and stress analysis model
• Completely automated the workflow of geometry designs, simulation and optimization for analysis of any integrated circuit cooling configuration.

As a result, he published 9 proceeding papers, of which he is first author on 6 papers; published 2 journal papers in which he is author on one of the papers; and has submitted/is submitting 3

papers in which is his first author on all the papers. His proceeding papers and journal papers are all in high impact journals indicating the excellent quality of his research work.

Professor Dulikravich writes:

....His hard work and dedication to life-long learning and constant search for improvement has enabled him to excel in both academics and research. As he developed his research skills, he broadened his scope of work into the fields of optimization, metamodels, electrogasdynamics and microelectronics cooling...

He has turned the work in his senior thesis into conference papers and award winning design. Specifically, in August of 2014, Sohail participated in American Society of Mechanical Engineer's inaugural Innovate Design and Simulation Challenge students' competition. Here, he had the opportunity to represent his research performed in my MAIDROC laboratory and Florida International University in front of participants from around the globe including representatives from institutions such as Georgia Institute of Technology and Indian Institute of Technology. His innovative airplane winglet shape design optimization grabbed the attention of faculty and student competitors from various schools and increased their interest in FIU and in his skills. His presentation at this competition won him the "Best Overall Impact Simulation" award....

Mr. Reddy is a highly enthusiastic, cheerful and very quick-minded and creative student with excellent presentation skills. I also want to point out that Mr. Reddy has been working several jobs to put himself through college....In summary, I recommend Mr. Sohail R. Reddy to you most highly for the Best M.Sc. Student Award in CEC.

Beyond the research area, Soheil has mentored many students working in the MAIDROC lab including three undergraduate senior design groups totaling 10 students. He was vice president of the TKE International Fraternity, a student tour guide for the College's Engineering Expo and an MME Department Student Ambassador for the College.

His honors include being given the ASME – "Best Overall Impact Simulation Award" at 2014 Innovative Design Simulation Challenge student competition and he is a finalist in the ASME 2015 Innovative Design Simulation Challenge student competition slated for August 2, 2015.

Soheil is serious, yet very positive person, as can be seen by the fact that he will be able to finish the MS in less than a year. Because of his abilities, he was awarded an FIU Presidential Fellowship to continue his PhD here, one of the very few awarded to FIU internal candidates. Because of all these reasons, I strongly recommend and support his nomination for Outstanding MS Graduate.

Sincerely,

I. N. Tansel

Ibrahim N. Tansel, PhD, FASME
Professor and Interim Chair

Department of Mechanical and Materials Engineering
10555 West Flagler Street, EC3475, Miami, Florida 33174 •Tel: 305-348-2569 • Fax: 305-348-1932 • www.fiu.edu
Florida International University is an Equal Opportunity/Access Employer and Institution • TDD via FRS 1-800-955-8771