भारतीय प्रौद्योगिकी संस्थान मुंबई
INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
पवई / Powai, मुंबई / Mumbai 400 076

Date of Issue : 02-November-2020 , liable to change since student has not yet graduated

Roll Number:	160010058	Academic Unit (B.Tech.): Aerospace Engineering
Name of the Student:	NAMAN AGGARWAL	Academic Unit (M.Tech.): Systems and Control Engineering
Programme:	Interdisciplinary Dual Degree (IDDD)	Joining Month & Year: July 2016

Code Name	Credits	Tag	Grade	Code Name	Credits	Tag	Grade
Academic Year: 2016 – 2017, Term: Semester Autumn							
BB 101 Biology	6.0	MA	BC	MA 105 Calculus	8.0	MA	BB
CH 105 Organic & Inorganic Chemistry	4.0	MA	CC	ME 119 Engineering Graphics & Drawing	5.0	MA	BC
CH 107 Physical Chemistry	4.0	MA	BB	NOCS01 NCC/NSS/NSO	0.0	MA	NP
CH 117 Chemistry Lab	3.0	MA	BB	PH 107 Quantum Physics and application	6.0	MA	BC
SPI= 7.31/10				CPI= 7.31/10			
Academic Year: 2016 – 2017, Term: Semester Spring							
AE 102 Data Analysis and Interpretation	6.0	MA	AA	ME 113 Workshop Practice	4.0	MA	BB
AE 152 Introduction to Aerospace Engg.	6.0	MA	AB	NOCS02 NCC/NSS/NSO	0.0	MA	PP
CS 101 Computer Programming and Utilization	6.0	MA	BB	PH 108 Basics of Electricity & Magnetism	6.0	MA	AB
MA 106 Linear Algebra	4.0	MA	AA	PH 117 Physics Lab	3.0	MA	AA
MA 108 Differential Equations	4.0	MA	AA				
SPI= 9.18/10				CPI= 8.28/10			
Academic Year: 2017 – 2018, Term: Semester Autumn							
AE 223 Thermodynamics and Propulsion	6.0	MA	AA	HS 101 Economics	6.0	MA	BB
AE 225 Incompressible Fluid Mechanics	6.0	MA	AA	MA 207 Differential Equations II	4.0	MA	BB
AE 227 Solid Mechanics	6.0	MA	AA	NOCS01 NCC/NSS/NSO	0.0	MA	PP
EE 101 Introduction to Electrical and Electronics Circuits	8.0	MA	AA	SC 201 Mathematical Structures for Systems and Control	6.0	MI	CC
SPI= 9.44/10				CPI= 8.66/10			
Academic Year: 2017 – 2018, Term: Semester Spring							
AE 234 Aircraft Propulsion	6.0	MA	AB	AE 242 Aerospace Measurements Laboratory	6.0	MA	AB
AE 236 Compressible Fluid Mechanics	6.0	MA	AP	CS 213 Data Structures and Algorithms	6.0	MI	FR
AE 238 Aerospace Structural Mechanics	6.0	MA	AA	MA 214 Introduction to Numerical Analysis	8.0	MA	AA
AE 240 Spaceflight Mechanics	6.0	MA	AA	ME 766 High Performance Scientific Computing	6.0	AL	CC
SPI= 9.68/10				CPI= 8.92/10			
Academic Year: 2018 – 2019, Term: Semester Autumn							
AE 219 Supervised Learning	6.0	MA	AA	AE 330 Aerospace Propulsion	6.0	MA	AB
AE 308 Control Theory	6.0	MA	AA	AE 333 Aerodynamics	6.0	MA	AA
AE 314 Aircraft Structures Laboratory	5.0	MA	AA	CS 663 Fundamentals of Digital Image Processing	6.0	MI	CC
AE 326 Vibrations and Structural Dynamics	6.0	MA	AA	HS 303 Psychology	6.0	MA	BB
SPI= 9.56/10				CPI= 9.06/10			
Academic Year: 2018 – 2019, Term: Semester Spring							
AE 305 Flight Mechanics II	6.0	MA	AB	AE 427 Control Systems Laboratory	5.0	MA	AA
AE 312 Aerodynamics Laboratory	5.0	MA	AB	CS 213 Data Structures and Algorithms	6.0	MI	AB
AE 316 Aircraft Propulsion Laboratory	5.0	MA	AA	EE 622 Optimal Control Systems	6.0	MA	AA
AE 332 Aircraft Design	6.0	MA	AB	GNR652 Machine Learning for Remote Sensing-I	6.0	AL	BB
AE 419 Supervised Learning	6.0	MA	AA	URA 01 Undergraduate Research Awards	0.0	MA	PP
SPI= 9.56/10				CPI= 9.14/10			

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Name of the Student: NAMAN AGGARWAL | Roll Number : 160010058

Code	Name	Credits	Tag	Grade	Code	Name	Credits	Tag	Grade
Academic Year: 2019 - 2020, Term: Semester Autumn
AE 407	Modelling and Simulation	6.0	MA	BB	ES 200	Environmental Studies: Science and Engineering	3.0	MA	BB
AE 410	Navigation and Guidance	6.0	MA	AB	HS 200	Environmental Studies	3.0	MA	AB
AE 493	BTP - I	6.0	HO	AA	SC 625	Systems Theory	6.0	MA	AB
CS 747	Foundations of Intelligent and Learning Agents	6.0	AL	CC	SC 643	Stochastic and Networked Control	6.0	MA	AB
SPI= 8.70/10					CPI= 9.09/10				
Academic Year: 2019 - 2020, Term: Semester Spring
AE 494	BTP - II	12.0	HO	AA	EE 737	Introduction to Stochastic Control	6.0	AL	AA
EE 736	Introduction to Stochastic Optimization	6.0	AL	AA	#SC 607	Optimization	6.0	AL	S
SPI= 0.00/10					CPI= 9.09/10				

Mandatory Course Credits (MA)	= 259.0	CPI (Courses)	= 9.15/10
Project Credits (PR)	= 0.0	CPI (Project)	= 0.00/10
Net Mandatory Credits (MA+PR)	= 259.0	CPI (Overall)	= 9.15/10
Overall Completed Credits	= 325.0		
Overall Grade Points	= 2901.0		

Current Status
The academic requirements for the degree are yet to be completed.
Signature & Seal of Transcript Issuing Authority:

Joint/Assistant Registrar (Academic), IIT Bombay.
Date: 02-November-2020
Place: Mumbai
Sr. Assistant Registrar (Academic)
भारतीय प्रौद्योगिकी संस्थान, मुंबई
Indian Institute of Technology, Bomba
पवई मुंबई/Powai Mumbai - 400 076

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Name of the Student: NAMAN AGGARWAL   Roll Number: 160010058

General Information

The medium of instruction at the Institute is English.

Course credits and grade: Each academic course is associated with a credit which is an indicator of its relative academic weight in calculating the academic performance. A two-letter grade is awarded to students on the basis of their performance in examinations and assignments of a specific course. The letter grades have numerical equivalents on a 0-10 scale as given below.

Letter Grade	AP	AA	AB	BB	BC	CC	CD	DD	FF	FR	W	DX	PP	NP	AU
Numerical Equivalent	10	10	9	8	7	6	5	4	0	0	–	–	–	–	–

FF: Fail, FR: Fail and repeat, W: Withdrawn, DX: Insufficient attendance, AU: Satisfactory performance in an audit course, PP: Pass, NP: Not Pass. The minimum passing grade in a course is DD. The grade AP is awarded to students with exceptional performance in core courses of a programme. Numerical equivalents of letter grades are referred to as grade points.

The numerical grade points are not convertible into marks or percentages.

Performance Indicators: The performance of a student in a semester is given by a number called the Semester Performance Index (SPI),which is the weighted average of the earned grade points in the courses during the semester.

If a student has courses with credits $C_1, C_2,..., C_n$, with grade points of $G_1, G_2,..., G_n$ respectively, then

Semester Credits = $C_1 + C_2 + ... + C_n$.	Semester Grade Points = $C_1G_1 + C_2G_2 + ... + C_nG_n$.	SPI = Semester Grade Points ÷ Semester Credits.

Cumulative Performance Index (CPI) is the weighted average of the grade points in the courses in all semesters. The indices SPI and CPI are calculated upto two decimal places.

#S grade is a place-holder and depicts notionally a PASS in a course, which contributes to the credit but is not used for SPI/CPI calculations. S grade can be converted to a letter grade by appearing in an exam. Otherwise, S grade will be converted to PP grade (ref. 242nd Senate).

Courses are tagged as MA: Mandatory (Core/Elective), MI: Minor, HO: Honours, AL: Additional Learning, AU: Audit

- Each degree programme has mandatory credits consisting of core courses, elective courses, and non credit courses. These courses are tagged as MA.
- For calculation of SPI and CPI, grades obtained only in mandatory courses (MA) are considered.
- Students can supplement the learning experience by crediting additional courses. Credits earned in these courses, when appropriate, can earn additional credentials either in the form of "Honours" (HO) in the chosen discipline or "Minor" (MI) in another discipline or both.
- "Honours" is not indicative of proficiency, and can be earned by completing the additional prescribed set of advanced core and elective courses in the chosen discipline. "Minor" can be earned by completing the prescribed set of courses in a discipline other than the chosen discipline. Additional courses that are not used for earning "Honours" or "Minor" are tagged as "Additional Learning" (AL).
- The AU is awarded based on satisfactory attendance and fulfilling the minimum requirements as set by the course instructor.It carries no grade points and does not figure in SPI or CPI calculations.
- PP or NP is awarded in some credit courses that are not earmarked with a letter grade. Correspondingly, PP/NP does not carry a grade point.

The Institute does not award any class or division. Notionally, the CPI may be multiplied by a factor of 10 to obtain a numerical percentage.

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END OF TRANSCRIPT   Roll Number: 160010058