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Engineering Through the Eyes of Faith

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Abstract

What is a biblical perspective of engineering? This paper seeks to answer some key questions related to the integration of faith and engineering. It is the second paper in a three paper sequel on this topic. It attempts to build from some initial concepts in a paper presented at the 2013 Christian Engineering Education Society (CEES) Conference [1] and deepen the analysis on common grace and use new examples and present new ideas on dominion mandate and its application to engineering and engineering education.

God is the Master Engineer. As an architect of His creation God presents wisdom as the basis of design in the universe. And this wisdom is no other than the Lord Jesus Christ. God is the source of all wisdom and all God's creation reveals His intelligent design. Men's knowledge is always secondary. By studying science and engineering, we are really reading God's mind regarding His creation. We can imitate God by design and/or engineering for the good of ourselves and others.

The doctrine of common grace helps those in science and engineering professions to understand God's dominion mandate, and His will and purpose for the entire human race. Engineering is part of God's common grace to mankind. He gave man this gift to help fulfill His call to "subdue the earth." Non-Christians are also bestowed this dominion mandate and they could contribute to the work of "subduing the earth" according to God's common grace. Examples from optical engineering are used to demonstrate this "subduing" process.

Finally, implementation of these teachings in engineering curriculum is discussed.

Note: Except where noted, all Scripture quotes in this paper are from the New King James Version Bible.

1. Scope

There are multiple ways to approach integration of faith and engineering. Some would focus more on mission engineering and service learning activities and related reflections. Others might put more emphasis on career oriented training and discipline specific studies. One can approach integration of faith and engineering from a devotional standpoint – how to become a Spirit-filled engineer. Others approach it from the mental challenge of developing a Christian worldview and establish a system of Christian thoughts that relate to engineering, i.e., a “theology of engineering”. The focus of this paper is on the latter, i.e, the development of a system of thinking that relates engineering with theology. Figure 1 shows the various aspects of integration of faith and engineering.

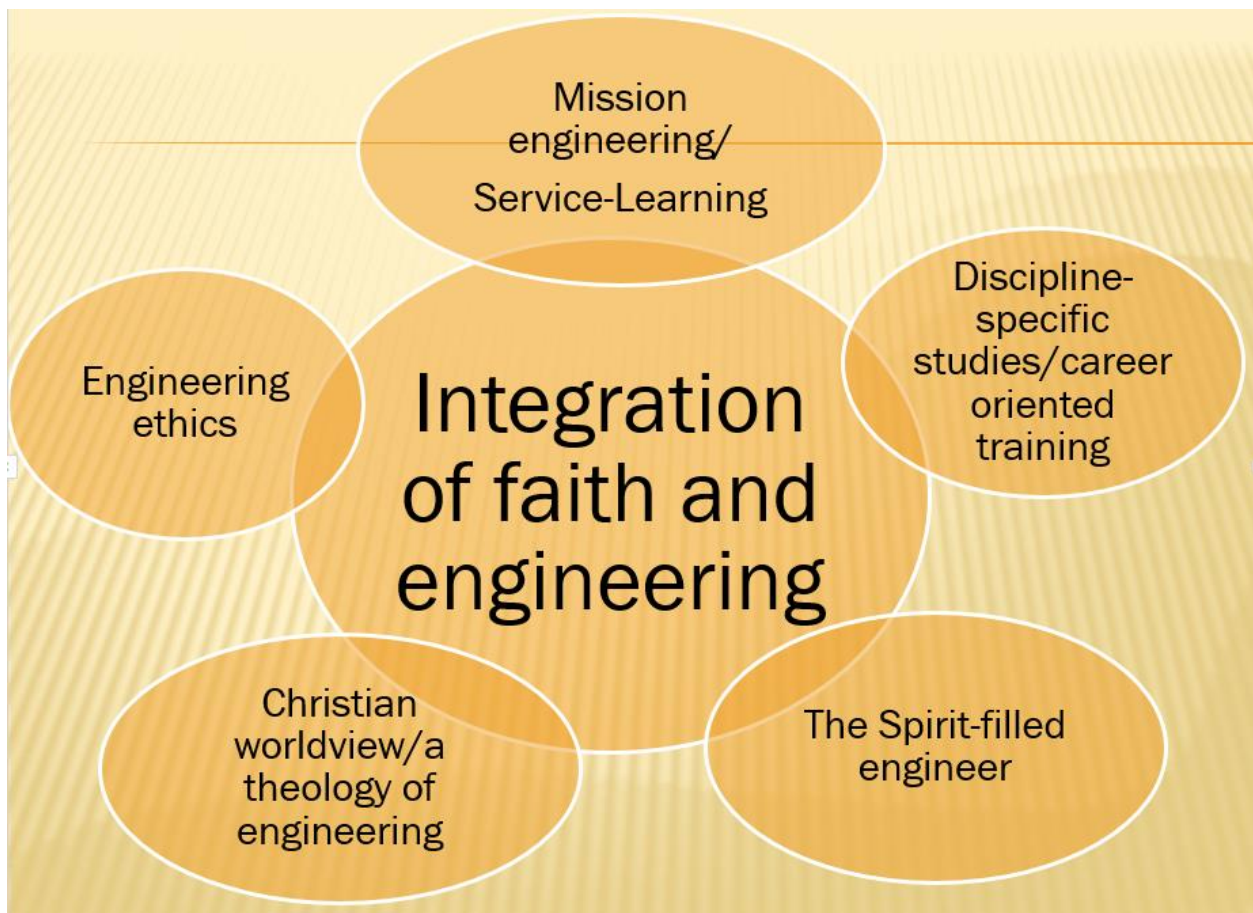


Figure 1 Diverse approaches to integration of faith and engineering

2. God the Master Engineer

Who was the first engineer? To answer this question, let's first define what an engineer is. According to Merriam-Webster online dictionary, an engineer is "a person who has scientific training and who designs and builds complicated products, machines, systems, or structures." [2]

Broadly speaking, God was the first "engineer." Genesis 1:1 states, "In the beginning, God created the heavens and the earth." Genesis 2:1-2 keeps on saying, "Thus the heavens and the earth, and all the host of them, were finished. And on the seventh day God ended His work which He had done; and He rested on the seventh day from all His work which He had done." From the whole narrative in the first chapter of Genesis, God is obviously the creator of time (Genesis 1:5), space (Genesis 1:6-7), and the host thereof which includes both earthly and heavenly (angelic) beings.

Laurel D. [3] using examples from nature, demonstrates that God is the **Master Engineer**. Some of her examples include spider webs, plants, skeletons of vertebrates, and mollusk shells. She asserts in her paper,

The overwhelming complexity and intricacy in the design of nature should send all engineers humbly to the feet of the **Master Engineer** to learn whatever design lessons they can! There is no engineering school that can give them that depth of knowledge, understanding and wisdom. The book of nature gives instruction in physical design principles, economy, functionality, aesthetics, safety, recyclability and a holistic approach to design. These principles, drawn from the **Master Engineer's** designs, should be engrained in engineering minds and reflected in every design. (Emphasis added)

God is the source of all wisdom (James 1:17). All God's creation reveals His intelligent design (Psalm 19:1-7). Even the great Greek philosopher Plato, who was not a Christian, had to admit in his work *Timaeus* that the world is a **handiwork** of a **mind** [4].

One of the most convincing evidences for such intelligent design can be found in a tiny molecule machine called ATP synthase. Life depends on this incredible enzyme, and it is the world's tiniest rotary motor [5]. Animations show the wonders of this design clearly [6] [7]. The following quote illustrates the matchless skills of our **Master Engineer** – God:

ATP Synthase is a molecular machine found in many living organisms. It serves as a miniature power-generator, producing an energy-carrying molecule, adenosine triphosphate, or ATP. The ATP synthase machine has many parts we recognize from human-designed technology, including a rotor, a stator, a camshaft or driveshaft, and other basic components of a rotary engine. This machine is just the final step in a long and complex metabolic pathway involving numerous enzymes and other molecules—all so the cell can produce ATP to power biochemical reactions, and provide energy for other molecular machines in the cell [8].

It would be unthinkable that these delicate biomechanical components in the ATP synthase would come together and start to function on their own. That would defy both logic and common sense. There must be a designer behind it. Just like when you see fully functional machinery with gears and motors running you know there must be a designer and an engineer behind it, when you see ATP synthase works the way it works you have to admit God is one who put these components together.

3. Man the Engineer

Men's knowledge is always secondary. By studying science and engineering, we are really reading God's mind regarding His creation. We can imitate God by designing/engineering for the good of ourselves and others. The first command from God to mankind as recorded in Genesis 1:28 is explicitly with regard to management and implicitly related to engineering:

Then God blessed them, and God said to them, “Be *fruitful* and *multiply*; fill the earth and *subdue it*; *have dominion over* the fish of the sea, over the birds of the air, and over every living thing that moves on the earth.” (Emphasis added)

This is commonly referred to as God's **dominion mandate** or **cultural mandate** to men.

Then the LORD God took the man and put him in the Garden of Eden to *tend and keep it*. (Genesis 2:15, emphasis added)

Here, the word “*tend*” means “*watch over*”, “*take care of*”, which mainly speaks of man’s stewardship role in the environment we are given to live in. The word “*keep*” is related more to maintenance, which is a big part of any engineering project today.

God gives all engineers a mind to learn from His creation, to gain knowledge necessary to design and manufacture products to benefit the rest of His creation. We are commissioned by God to continue to “engineer” a better world on this earth and beyond.

ATP synthase speaks of wisdom, intelligence, capability, or rationality in its creator, some of the exact attributes of God as revealed in the Bible! When we investigate His handiwork, we are both obeying His command in Genesis 1:28 to do the work necessary to “subdue the earth”, and we have even more reason to praise and enjoy Him for His providence and genius [9].

4. The Distinction

An important distinction between God the engineer and man the engineer is that God can create something out of nothing (in Latin, “*ex nihilo*”). Man cannot. Thus God is far superior to man as an engineer. For example, in Genesis 1 the Scripture chronicles God’s creation of light. It took man over 6,000 years to study the nature of light and come up with a body of knowledge called “optics.” By the early 1800s, most scientists believed that light is a wave. In 1865 a Christian physicist James Maxwell discovered that electric and magnetic fields work together to produce light and light is an electromagnetic wave [10]. Later on, scientists discovered that light also exhibits particle properties. Scientists’ understanding of light continues to evolve.

In optical engineering, engineers strive to learn how to make use of the light God created. Laser, one of the major technological breakthroughs in the field of optical engineering in the 21st century, is now being used in almost all areas of life. For manufacturing it is used for high powered precision cutting and welding. Laser scanning revolutionized dimensional inspection and measurement due to its non-contact nature. Laser also revolutionized the business of shipping and logistics as it is widely used in package/item

identification via bar code scanning. Laser has also been heavily used in the medical field, providing healing and treatment to thousands of patients every day. It is also used in the entertainment industry (laser light concert, laser games), etc.

Some might argue that man can create new forms of light, such as the laser:

Lasers are a special form of light. Laser light does not exist in nature.

Only human technology can create laser light [11].

However, upon further analysis, we realize that the name LASER stands for Light Amplification by Stimulated Emission of Radiation. The laser light comes from solid state materials that God already created, as it is further explained here:

An atom gives out a photon of light if an electron in the atom falls from a higher energy level, or excited state, to a lower one. In most cases, excited electrons give off light in this way of their own accord. This is called spontaneous emission. In a few cases, the properties of the excited state prevent electrons from giving off light unless they are triggered by another photon of light. This process is called stimulated emission [12].

“Subdue it,” as stated in Genesis 1:28, implies “bending it to your purposes,” according to Blocki [13]. The creation and engineering of laser is a good example of this “bending” process:

The first laser, built in 1960, was a ruby laser. This type of laser contains a rod of synthetic ruby with mirrored ends. Bursts of white light from a coiled flashtube around the rod excite atoms in the ruby. Once one of the excited atoms manages to emit a photon spontaneously, that photon stimulates other excited atoms to emit light as it reflects back and forth between mirrors mounted at the ends of the rod. One of the end mirrors is half-silvered so the laser beam can undergo multiple reflections inside the tube and escape [12].

We can see from the above description that a useful, coherent laser beam is formed by literally “bending” the emitted light (that God created) multiple times using man-made mirrors. The coherent light can travel long distance without spreading. In other words, it

keeps a sharp focus, thus providing a powerful concentration of light energy and could be used in various applications. Clearly laser is the product of human engineering activities, and it is definitely not “ex nihilo,” or “created out of nothing.” Only God can create something out of nothing.

Another important distinction between God and man is that God is all-knowing, while man is not. Not all engineering failure is due to man’s sins. Some are simply the result of man’s limitation in knowledge. We are creatures. God is the creator. Human engineering activities are always limited in scope. As David Shaw quoted in his integration paper, “It is also important not to confuse our finitude with the results of the fall. Many of the limitations on our ability come from man’s finitude [14] which is equally shared by the Christian and non-Christian.” [15]

5. Common Grace and Engineering

A student once asked me this question, “Why are some non-Christians as successful, if not more successful, than Christians in the professional fields?” The only thing I could think of at the time was two verses from I Corinthians 1:26-27:

“Brothers and sisters, think of what you were when you were called. Not many of you were wise by human standards; not many were influential; not many were of noble birth.

But God chose the foolish things of the world to shame the wise; God chose the weak things of the world to shame the strong.”

I explained to him that if all Christians are more successful than non-Christians, then everyone would want to become Christians. It is the wisdom of God that He chose the weak to humble the strong. After I was exposed to the doctrine of common grace in Reformed circles, I was convinced that this doctrine can help answer a lot of such questions. It just made sense.

Common grace refers to the sovereign grace of God bestowed upon all of mankind regardless of their election. In other words, God has always bestowed His graciousness on *all people in all*

parts of the earth at *all time* [16]. Without God's common grace, the human race would have been extinct a long time ago.

In Psalm 145:15-16 we see God's common grace to all His creation:

“The eyes of all look expectantly to You, and You give them their food in due season. You open Your hand and satisfy the desire of every living thing.”

Many theologians and scholars and church fathers believed that the Noahic covenant (Genesis 8 and 9) is a covenant of common grace. Calling Abraham Kuyper the father of the doctrine of common grace, Cammenga [17] quoted him as saying,

“The firm historical starting point for the dogma of common grace lies in the establishment of the covenant of God with Noah after the Flood. To this significant and decisive event, in the last instance, not enough attention is paid. One too quickly passes on to Abraham and the patriarchs, and consequently the weighty significance of the Noahic covenant at first is pushed into the background and then is almost forgotten.... We must therefore begin by again placing the great significance of the Noahic covenant in its clear light.”

“The grace that is shown here is not particular, restricted only to the elect and leading to eternal life, but common, extending to all that have breath, and leading to a human existence on this earth, under this dispensation.”

“Its content lies exclusively in the sphere of natural life, has to do with temporal and not eternal blessings, and applies to unbelievers as well as to those who fear God....”

The doctrine of common grace would help lay members, especially those in professional fields such as science and engineering to understand God's dominion mandate, and His will and purposes for the entire human race. God gives engineering talents and gifts to the godly and ungodly, just like He causes rain to fall and sun to shine on the righteous and the wicked. Engineering and technology is a vehicle by which man carries out the dominion mandate. This belongs to the common grace category. Wayne Grudem has this to say about common grace's impact on mankind:

“The common grace of God in the intellectual realm also results in an ability [for man] to grasp truth and distinguish it from error, and [for man] to experience growth in knowledge that can be used in the investigation of the universe and in the task of subduing the earth. This means that *all science and technology carried out by non-Christians is a result of common grace*, allowing them to make incredible discoveries and inventions, to develop the earth’s resources into many material goods, to produce and distribute those resources, and to have skill in their productive work.” [18] (Emphasis added)

Another view of common grace comes from covenantal theology. Chapter 7 of the Westminster Confession of Faith [19] has this to say about God’s covenant with man:

“The distance between God and the creature is so great, that although reasonable creatures do owe obedience unto Him as their Creator, yet they could never have any fruition of Him as their blessedness and reward, but by some voluntary condescension on God’s part, which He has been pleased to express by way of covenant.”

God has at least two covenants with men: the covenant of works and the covenant of grace. The Confession went on to say:

“The first covenant made with man was a covenant of works, wherein life was promised to Adam; and in him to his posterity, upon condition of perfect and personal obedience.

Man, by his fall, having made himself incapable of life by that covenant, the Lord was pleased to make a second, commonly called the covenant of grace; wherein He freely offers unto sinners life and salvation by Jesus Christ; requiring of them faith in Him, that they may be saved, and promising to give unto all those that are ordained unto eternal life His Holy Spirit, to make them willing, and able to believe.”

The Reformed Presbyterian Church of North America Testimony [20] made a comment on this section of the confession, which leads to their definition/interpretation of common grace:

“The Covenant of Works has not been revoked. All men remain under its requirement of perfect obedience and will have to give account according to it at the last judgment. In the Covenant of Grace Jesus Christ has fulfilled the requirements of the Covenant of

Works for His people. By His death Christ secured the delay of the full penalty of death for sin (the second death, Rev. 20:14-15) for all men. They therefore may enjoy the creation and have some fruitful toil in it for God's glory, even though they be rebellious against Him. This is usually called **common grace**." (Heb. 12:14; 2 Cor. 5:10, 21; Col. 1:16-20; 1 Cor. 8:6; Gen. 4:20-24; Ps. 76:10. Emphasis added)

6. Why Common Grace?

Mankind doesn't deserve anything. All mankind deserves is immediate death, for the wages of sin is death (Romans 6:23). For mankind to continue to carry out the dominion mandate, God's grace is essential. There are at least three purposes for God to provide common grace:

1. God wants mankind to continue on earth and flourish.
2. God is patiently waiting for more souls to come to Him for salvation, using common grace as a witness.
3. God wants to carry out His divine purposes for His Church.

Scriptures that directly support these views are Psalm 36:6, I Tim. 4:10, Col. 1:16-20, Acts 14:17, and Rom. 8:28. For example,

"Your righteousness is like the great mountains; Your judgments are a great deep; O Lord, You preserve man and beast." (Psalm 36:6)

"For to this end we both labor and suffer reproach, because we trust in the living God, who is the Savior of all men, especially of those who believe." (I Tim. 4:10)

The above two verses speak of "preserve" and "save," both of which show God's intention to keep man and beast from destruction or extinction. This shows God's goodness and mercy. The very fact that God chose to delay punishment of sins of the human race is indicative of His common grace. Wayne Grudem in his popular book "Systematic Theology" said,

"It is not unjust for God to delay the execution of punishment upon sin and to give temporary blessings to human beings, because the punishment is not forgotten, but just

delayed. In delaying punishment, God shows clearly that He has no pleasure in executing final judgment, but rather delights in the salvation of men and women.” [18]

Non-Christians are in rebellion against God; their understanding is darkened. They don't have a basis for true knowledge of the universe and God. However, non-Christians are also bestowed the dominion mandate and they could contribute to the work of “subduing the earth” according to God's common grace. In engineering, the development of modern transportation systems involves both the saved and unsaved engineers. Without the unsaved engineers' contribution, we wouldn't be enjoying the convenience of modern technology we are enjoying now. And these technologies are also enabling missionaries to go out into the ends of the world to preach the gospel.

The existence of organizations and structures in human society is another evidence of God's common grace. They help facilitate the delivery of God's love to mankind. Examples include family, government, educational institutions, businesses and corporations, voluntary associates (such as many charitable and public service groups), and countless examples of ordinary human friendship [18].

7. What Should Our Responses Be?

We should thank Him for His special grace for us. We should also thank Him for His common grace to all men. One of the natural outcomes from a common grace perspective to life is a fresh respect and appreciation for our coworkers who are not Christians. As Tim Keller stated [21],

“Understanding common grace provides the basis for Christians to cooperate with and learn from non-Christians.”

The doctrine helps Christians to be more humble and ready to learn from non-Christians. Shaw recognized the danger of pride for Christian engineers:

“Christians are not necessarily more creative than pagans, since God gives His common grace, allowing apparently wise choices to be made by all sorts of men. There is the hazard of a sort of pride in being a Christian, where we start to believe that Christians

should, of necessity, be the very best in their fields, and if they are not it is because of weak Christianity or intellectual laziness. We should recognize that God, in His common grace, has given unbelievers great abilities too.” [15]

The doctrine of common grace could also be a good tool for use in evangelism. As it is pointed out in an article on common grace,

“Those who are ambassadors for Christ must be for both graces, the former grace often opens the door for the latter grace.” [22]

Sharing of the doctrine of God’s common grace with non-believers conveys to them a special recognition and acceptance that might benefit them and make them more receptive of the gospel. “The doctrine of common grace helps us to acknowledge God’s goodness in all of creation and enables us to pursue mission with love in a fallen world.” [21]

Max Deffenbaugh also noted the importance of teaching engineering students the doctrine of common grace as he shared in the 2009 CEES conference,

“When engineering students enter the workplace, their colleagues will include people of all faiths. It is a valuable lesson in helping students to work effectively and comfortably in diverse teams to appreciate the engineering excellence of their colleagues as a gift of God, even if their colleagues may not recognize it as such. Indeed it is a vital aspect of the students’ own Christian witness not to show religious favoritism in their professional interactions. Understanding engineering as a common grace activity is foundational to making students effective engineers and effective Christian witnesses in a diverse workplace.” [23]

8. Common Grace vs. Special Grace

God’s grace includes common and special (or saving) grace. “Common grace is the grace shown by the Creator to and for His creation. This ‘common’ grace is given regardless of the recipient’s awareness and acceptance of it. Special grace is bestowed upon those who enter into a personal relationship to the Creator through Jesus Christ.” [22]

Analysis may help us understand complex phenomena. However, analysis needs to work hand-in-hand with synthesis in order to have a holistic picture of life. The two covenants (covenant of works and covenant of grace) view espoused by the Westminster Confession of Faith helps us see more clearly the unique ways of God's dealings with man, but we should not lose sight of the fact that the two covenants are one, as the same confession concluded. Why it is one? Through the failure of man to fulfill the covenant of works on his own, he sees the need of a Savior. The covenant of works leads man to the covenant of grace. And God knows from the very beginning that man cannot hold the other end of the stick of this covenant of works without His help. It is all a learning process for mankind to know that our life is in Christ. We are elected in Christ before the world existed (Ephesians 1:4). God's plan is to draw us to gaze upon Jesus. If we trust in Him, we will see God's good, acceptable and perfect will for us (Romans 12:2).

For analysis, God's grace conveniently fits into common grace and special grace categories, but we should also recognize in the two graces this oneness that reflects God's goodness. Just like the covenant of works leads us to see our inadequacy in our own strength, the relative peace and prosperity afforded us by the so-called "human flourishing" due to God's common grace lacks eternal satisfaction in our souls. It cannot provide an ultimate purpose in our lives. So God's common grace is meant to lead us to appreciate and receive His special grace, as it is clearly stated in the Scriptures (Acts 14:17, Romans 2:4). What common grace can offer the world is temporal, what special grace can offer a soul is eternal.

One of the best examples to illustrate the relationship between common grace and special grace is found in the Gospel story of Jesus speaking to a woman at the well. Jesus said to a Samaritan woman,

"If you knew the gift of God, and who it is who says to you, 'Give Me a drink,' you would have asked Him, and He would have given you living water." (John 4:10)

Jesus then continued to tell her,

"Whoever drinks of this water will thirst again, but whoever drinks of the water that I shall give him will never thirst. But the water that I shall give him will become in him a fountain of water springing up into everlasting life." (John 4:13-14)

Here obviously the natural water was provided to her through God's common grace. Everyone can draw that water from the well – saved or unsaved. But if that is all she drank, she would thirst again. Only after she received God's special saving grace that she became bold, and was no longer feeling the shame of sin. She delightfully proclaimed to the whole town the name of Jesus.

As Christian engineers, we have God's special grace. It does not mean we no longer need God's common grace, as we still need to go to work like the woman at the well still needs to go to the well to draw water to drink everyday even after she was saved. But her outlook for life had forever changed. She was delivered from the bondage of sin. She was liberated and had a new purpose in life. Similarly, Christian engineers can participate in their daily routine work with a renewed hope, purpose, and a perspective on life that is eternally meaningful. This is more abundant life. Without God's special grace, no matter how successful people are in this life, there is still a void in their hearts that yearns for purpose, love and eternal meaning. Common grace can satisfy our stomach, but it cannot satisfy our soul. It can make human society "flourish", but it cannot give us life more abundantly.

Special grace and common grace are also mutually beneficial. There is a dynamic interaction between the two. A peaceful life provided by God's common grace helps the spread of the gospel, thus promoting the special grace of God. The reception of God's special grace by certain people groups also enhances God's common grace in that society. It helps form a culture that is more healthy for human survival and flourishing. A shining witness to this theory is the emergence of America on the world stage. The influx of Protestant Christians from Europe forever changed the makeup of the American population. The Church thus had a good witness and influence on the society. And God blessed America and it is now the strongest nation in the world. As postulated by Max Weber, the rise of the West is in large part due to the Protestant faith and its ethics [24]. The Protestant influence in America's politics in the early days of its founding paved the way for the best government and legal system the world has ever seen. This in turn leads to enhanced common grace of God in the land and helps its people to flourish. The relative peace that America enjoyed since its founding helped her to become by far the most missionary-sending country in the world still to this date [25].

On the contrary, anti-God ideology and practices often lead to a reduced measure of common grace, as evidenced by the impoverishment of countries like North Korea. In China, the Mao-era brought man-made disasters to its people because the regime was basically anti-God and oppressive to Christians. After Mao, even though the economy seems to be high flying in the past three decades, the regime's attitude and policy towards Christianity is still about the same. As a result, the moral value and social conditions continue to slide and there are massive environmental degradation and social upheaval in the country. Pollution is at such a dangerous level in China that it is already impacting the rest of the world [26].

The secularization of America in recent decades had caused a negative effect on God's common grace on this nation. As God was continuously being pushed out of schools, courts and other public squares, America lost out on God's protection as evidenced by the rise of terrorism against America in recent years. It is quickly turning into a country with the most national debts.

The revival of Christianity in China in recent decades is also pushing China towards a better future as a country. It already is the largest creditor to the US. China's continued modernization will inevitably lead to more openness in media and press, and more freedom in political, economic and social and religious realms. And these are all good indicators of an increased measure of God's common grace.

One special case that makes the distinction between common grace and special grace difficult is in relation to the Jewish people. The Jewish people are God's elect, but a majority of them are not yet born-again Christians. In other words, a majority of them do not have the special (saving) grace. But they do receive a lot of common grace, as evidenced by a disproportionately large percentage of Nobel Prize winners being from among them:

“At least 197 Jews and people of half- or three-quarters-Jewish ancestry have been awarded the Nobel Prize, accounting for 22% of all individual recipients worldwide between 1901 and 2016, and constituting 36% of all US recipients during the same period. Jews currently make up approximately 0.2% of the world's population and 2% of the US population.” [27]

In other words, they do receive a “special” measure of common grace throughout their history. At a certain time in the future though, as Romans 11:25-32 seem to indicate, it will be massive

conversion of the Jewish people to receive special (saving) grace. This last point is not without debate among theologians, but if this interpretation of the passage stands to be true, the special grace to be bestowed on the Jews in the last days will be so commonplace that we can say, in days past common grace was special for the Jews, but in the last days special grace will be common for them (pun intended).

Other noted authors on common grace include Abraham Kuyper [28] and Gary North [29]. There are also those who disagree with the view of common grace, notably authors from the Protestant Reformed Churches [30]. They explain it through God's patience, instead of God's grace. In final analysis, no matter how you look at it, it is all God's goodness and mercy towards mankind.

9. Implementation in the Engineering Curriculum

Throughout this study, the author had been actively engaging engineering students in the classroom about these topics. Some Christian colleges encourage integration of faith and engineering more than others, but since the materials are modular in nature, they can easily be integrated into any classes an engineering professor would typically be teaching and it would normally only takes up 1-2 lectures.

At Geneva College, the author would cover this material at the very end of a sophomore level solid mechanics class that is required of all engineering majors. At Anderson University in the Spring of 2016, the author covered this material at the beginning of a "Service Engineering" course (an elective) to give students some grounding in biblical worldview as it relates to engineering. At Mount Vernon Nazarene University in the Spring of 2017, the author covered this material in a one credit hour course on engineering ethics.

When discussing God being the master engineer, the author would show students animations of the ATP synthase [6][7]. Even though it is a topic of biology, the moving parts in an ATP synthase are very similar to mechanical components of gears and shafts and mechanical engineering students can readily relate to it. Students are also assigned to read an integration paper by Laurel Dovich [3] and engage in a classroom discussion and essay writing. Feedback from students are in general positive because, for one, they need information like this to guide

them in their careers and/or Christian walk. And, it provides a nice change of pace by breaking from the traditional coverage of “hard” engineering subjects. Students in general love it, because it is what a liberal arts based engineering education is expected to provide for them.

The following are course objectives that pertain to the contents discussed in this paper:

After successful completion of the course, students will:

- 1. Have a biblical understanding of engineering and technology*
- 2. Have an understanding of the doctrine of common grace and its implications in engineering*
- 3. Obtain a worldview of glorifying God in everything we do, whether it is working on mission engineering projects or working as a professional engineer in the industry*

The following are sample student responses:

Short Answer Question: Why are some non-Christians as successful, if not more successful, than Christians in the professional fields?

Student A Answer: “Because if all Christians were more successful, everyone would want to follow Christ for the wrong reasons. God chose the weak to make them strong, He chooses the poor to make rich. Now, all good comes from God, and all men are allowed to succeed by the doctrine of “Common Grace,” in which all of humanity has God’s blessing over them simply from being created by Him. However, by taking the steps to follow God and choosing to turn against our sinful nature, a person’s life will most certainly be better. Maybe not financially, or relationally, as there are many people out there who have angst towards Christians, and the true enemy will most certainly try to persuade one from being born again, but having a relationship with Christ is far more rewarding than could ever be measured by any human standards.”

Student B Answer: “I know many good and successful people who are non-Christians. I believe through common grace, God can exercise his sovereignty and bring good to the world through a non-Christian. 1 Timothy 4:10 says, ‘That is why we labor and strive, because we have put our hope in the living God, who is the Savior of all people, and especially of those who believe.’ Non-Christians can still impact the world in countless

ways. God is the savior of all people and extends common grace to everyone, believer or unbeliever.”

The following are some sample student responses from reading Laurel Dovich’s paper [3] on the topic of God being the Master Engineer:

Question: What example(s) did the author use to illustrate the superior quality in God’s design and “manufacture” of His creation? Share something that struck you while reading this section of the paper.

Student C Answer: “The author shows examples of the superiority of God’s design, such as the building blocks of life (proteins, minerals, sugars), the human body, and many consistencies in design across different species of animals and plants. One thing that struck me in this section is that God created all of this from nothing. From the smallest atoms and molecules to the massive stars and planets, everything points to a single creator! Even just typing these words gives me chills thinking of the power behind our creator. Even more so, he invites us into a relationship with him. He designed us and loves us as well.”

Question: Which structural engineering example in nature is most inspiring to you? Why?

Student D Answer: “The spider web. The intricacy and strength in something so small is amazing. It makes me feel more capable because if God created a spider to create something like a spider web, he definitely has given humans massive resources to create.”

These sample student work demonstrate that the course objectives are met.

10. Conclusion

God is the mastermind of all creation. It is not a stretch to say, therefore, that God was the first engineer. As God’s image-bearers, men are also called to do engineering. Engineering is a gift from God to man, regardless of him being a Christian or not. This is part of God’s common grace to mankind. He gave man this gift to help fulfill His call to “subdue the earth”. However, due to the fallen nature of man, engineering will also be corrupted by sin. The only solution to this

problem is the redemptive work of Jesus Christ. The solution of sin problems in engineering rests with the gospel. The whole world needs Christ's redemption. Man cannot have dominion over God's creation on his own – God never intended it to be that way from the very beginning. All men need Christ. That is the true essence of a “new” dominion mandate – a Christ-centered dominion mandate.

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